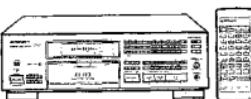


# Service Manual



ORDER NO.  
ARP2228

COMPACT DISC PLAYER

# PD-31

**PD-8700**  
**PD-7700**

**PD-8700-S**  
**PD-7700-S**

PD-31, PD-8700, PD-8700-S, PD-7700 AND PD-7700-S HAVE THE FOLLOWING :

Type	Model					Power Requirement	Remarks
	PD-31	PD-8700	PD-8700-S	PD-7700	PD-7700-S		
KU	○	—	—	○	—	AC120V only	
KC	—	—	—	○	—	AC120V only	
HEM	—	○	—	○	—	AC220-230V, AC230-240V(switable)*	
HB	—	○	—	○	—	AC220-230V, AC230-240V(switable)*	
SD	—	○	—	○	—	AC110V, 120-127V, 220V, 240V(switable)*	
HEWM	—	—	○	—	○	AC220-230V, AC230-240V(switable)*	
HPW	—	—	—	○	—	AC220-230V, AC230-240V(switable)*	

\* : Change the primary wiring of the power transformer.

- This manual is applicable to the PD-31/KU, PD-8700/HEM, HB, SD, PD-8700-S/HEWM, PD-7700/KU, KC, HEM, HB, SD, HPW and PD-7700-S/HEWM types.
- As to the PD-8700/HEM, HB, SD AND PD-8700-S/HEWM types, refer to page 81.
- As to the PD-7700/KU, KC, HEM, HB, SD, HPW and PD-7700-S/HEWM types, refer to page 83.
- Ce manuel pour le service comprend les explications de réglage en français.
- Este manual de servicio trata del método ajuste escrito en español.

## CONTENTS

1. SAFETY INFORMATION	2	6. AJUSTE	65
2. EXPLODED VIEWS AND PARTS LIST	4	7. FL INFORMATION	80
3. P.C.B's PARTS LIST	11	8. FOR PD-8700/HEM, HB, SD AND	
4. PACKING	14	PD-8700-S/HEWM TYPES	81
5. SCHEMATIC DIAGRAM AND P.C.BORDERS		9. FOR PD-7700/KU, KC, HEM, HB, SD, HPW AND	
CONNECTION DIAGRAM	15	PD-7700-S/HEWM TYPES	83
6. ADJUSTMENTS	35	10. PANEL FACILITIES	101
6. RÉGLAGE	50	11. SPECIFICATIONS	103

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This service manual is intended for qualified service technicians; it is not meant for the casual do-it-yourselfer. Qualified technicians have the necessary test equipment and tools, and have been trained to properly and safely repair complex products such as those covered by this manual.

Improperly performed repairs can adversely affect the safety and reliability of the product and may void the warranty. If you are not qualified to perform the repair of this product properly and safely, you should not risk trying to do so and refer the repair to a qualified service technician.

#### WARNING

Lead in solder used in this product is listed by the California Health and Welfare agency as a known reproductive toxicant which may cause birth defects or other reproductive harm (California Health & Safety Code, Section 25249.5).

When servicing or handling circuit boards and other components which contain lead in solder, avoid unprotected skin contact with the solder. Also, when soldering do not inhale any smoke or fumes produced.

## 1. SAFETY INFORMATION

(FOR USA MODEL ONLY)

### 1. SAFETY PRECAUTIONS

The following check should be performed for the continued protection of the customer and service technician.

#### LEAKAGE CURRENT CHECK

Measure leakage current to a known earth ground (water pipe, conduit, etc.) by connecting a leakage current tester such as Simpson Model 229-2 or equivalent between the earth ground and all exposed metal parts of the appliance (input/output terminals, screwsheads, metal overlays, control shaft, etc.). Plug the AC line cord of the appliance directly into a 120V AC 60Hz outlet and turn the AC power switch on. Any current measured must not exceed 0.5mA.

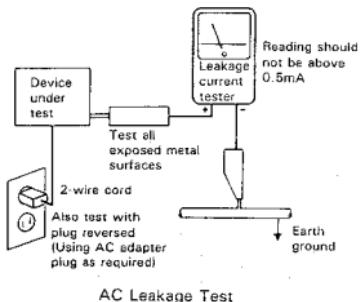
ANY MEASUREMENTS NOT WITHIN THE LIMITS OUTLINED ABOVE ARE INDICATIVE OF A POTENTIAL SHOCK HAZARD AND MUST BE CORRECTED BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

### 2. PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in the appliance have special safety related characteristics. These are often not evident from visual inspection nor the protection afforded by them necessarily can be obtained by using replacement components rated for voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this Service Manual.

Electrical components having such features are identified by marking with a  $\Delta$  on the schematics and on the parts list in this Service Manual. The use of a substitute replacement component which does not have the same safety characteristics as the PIONEER recommended replacement one, shown in the parts list in this Service Manual, may create shock, fire, or other hazards.

Product Safety is continuously under review and new instructions are issued from time to time. For the latest information, always consult the current PIONEER Service Manual. A subscription to, or additional copies of, PIONEER Service Manual may be obtained at a nominal charge from PIONEER.



(FOR EUROPEAN MODEL ONLY)

VARO!

AVATTAESSA JA SUOJALUKITUS OHITTEAESSA OLET ALTITINA NAKYMATOMALLE LASERSÄTEILYILLE. ALÄ KATSO SÄTEESEEN.



LASER  
Kuva 1  
Lasersäteilyn varoitusmerkki

WARNING!

DEVICE INCLUDES LASER DIODE WHICH EMITS INVISIBLE INFRARED RADIATION WHICH IS DANGEROUS TO EYES. THERE IS A WARNING SIGN ACCORDING TO PICTURE 1 INSIDE THE DEVICE CLOSE TO THE LASER DIODE.



LASER  
Picture 1  
Warning sign for laser radiation

ADVERSEL:

USYNLIG LASERSTRÅLING VED ÅBNING NÅR SIKKERHEDSAFTRYDRE ER UDE AF FUNKTION UNDGA UDSAETTELSE FOR STRÅLING.

IMPORTANT

THIS PIONEER APPARATUS CONTAINS LASER OF HIGHER CLASS THAN 1. SERVICING OPERATION OF THE APPARATUS SHOULD BE DONE BY A SPECIALLY INSTRUCTED PERSON.

WARNING!

OSYNLIG LASERSTRÅLNING NÄR DENNA DEL ÄR ÖPPNAD OCH SPÄRREN ÄR URKOPPLAD. BETRÄKTA EJ STRÅLEN.

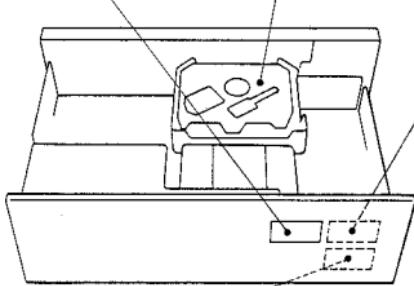
LASER DIODE CHARACTERISTICS  
MAXIMUM OUTPUT POWER: 5 mW  
WAVELENGTH: 780-785 nm

LABEL CHECK

HB,HEM and HEWM types

CLASS 1  
LASER PRODUCT

VRW328



HEM and HEWM types

VARO!  
AVATTAESSA JA SUOJALUKITUS OHITTEAESSA OLET ALTITINA NAKYMATOMALLE LASERSÄTEILYILLE. ALÄ KATSO SÄTEESEEN.

WARNING!  
Oppslig laserstrålning når denne del er åpnet og sikkerhedsdelen er urkopplad. Betrakta ej strålen.

PRW101

Additional Laser Caution

1. Laser Interlock Mechanism

The ON/OFF (ON : low level, OFF : high level) status of the LPS1 (S601) and LPS2 (S602) switches for detecting the loading state is detected by the system microprocessor, and the design prevents laser diode oscillation when both switches LPS1 and LPS2 are not ON (low level)(clamped state). Thus, interlock will no longer function if switches LPS1 (S601) and LPS2 (S602) are deliberately shorted.

Also, in the test mode\*, the interlock mechanism does not operate too. Laser diode oscillation will continue if pins 2 and 3 of CXA14715 (IC101) are connected to ground or pin 20 is connected to high level (ON) or the terminals of Q101 are shorted to each other (fault condition).

2. When the cover is opened with the servo mechanism block removed to be turned over, close viewing of the objective lens with the naked eye will cause exposure to a Class 1 or higher laser beam.

HEM and HEWM types

HB type

CAUTION  
INVISIBLE LASER  
RADIATION WHEN OPEN,  
AVOID EXPOSURE  
TO BEAM

PRW1018

\* Refer to page 36.

## 2. EXPLODED VIEWS AND PARTS LIST

### NOTES :

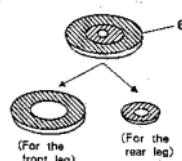
- *Parts without part number cannot be supplied.*
- *Parts marked by "●" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*
- *The ▲ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*

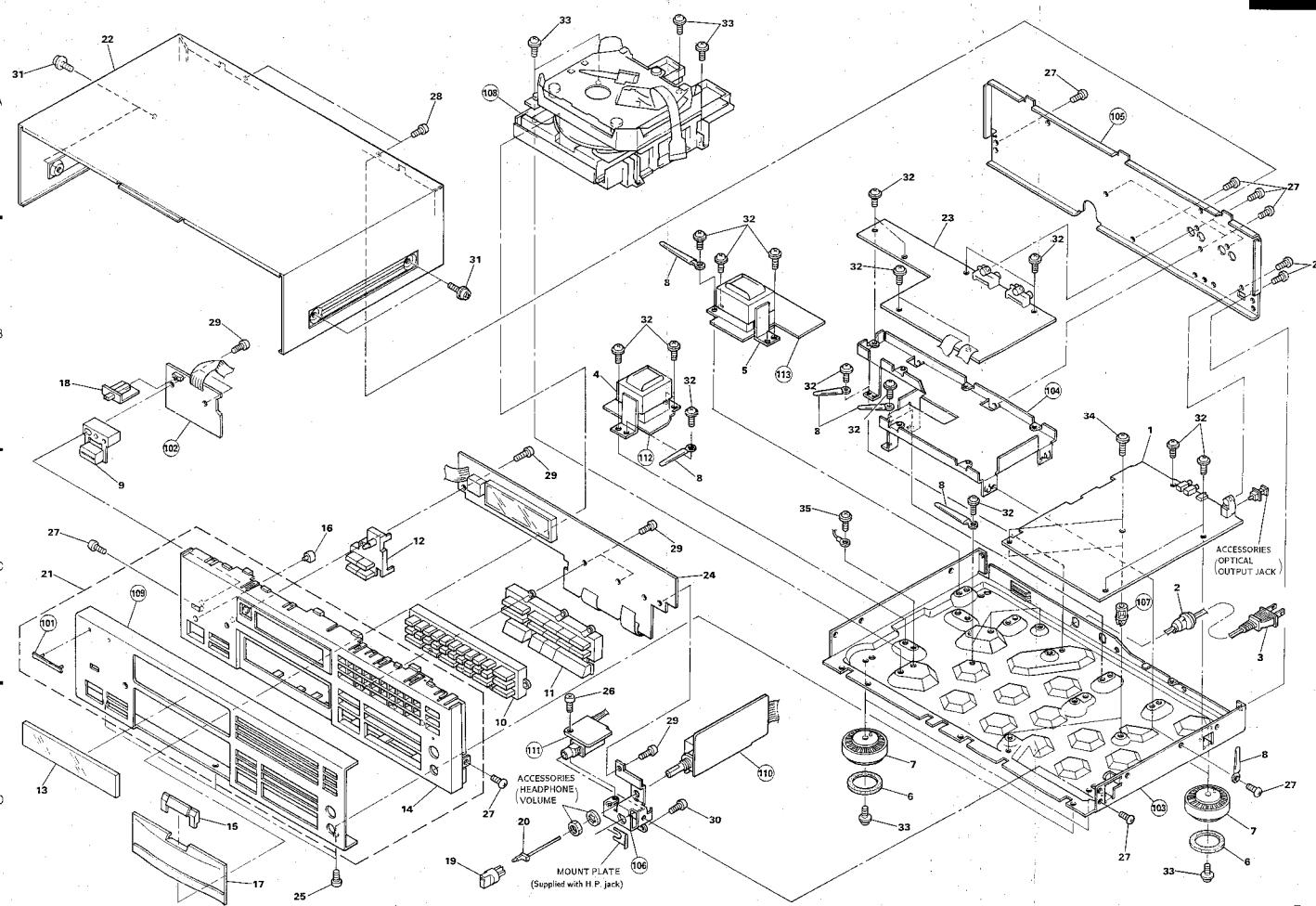
### 2.1 EXTERIOR

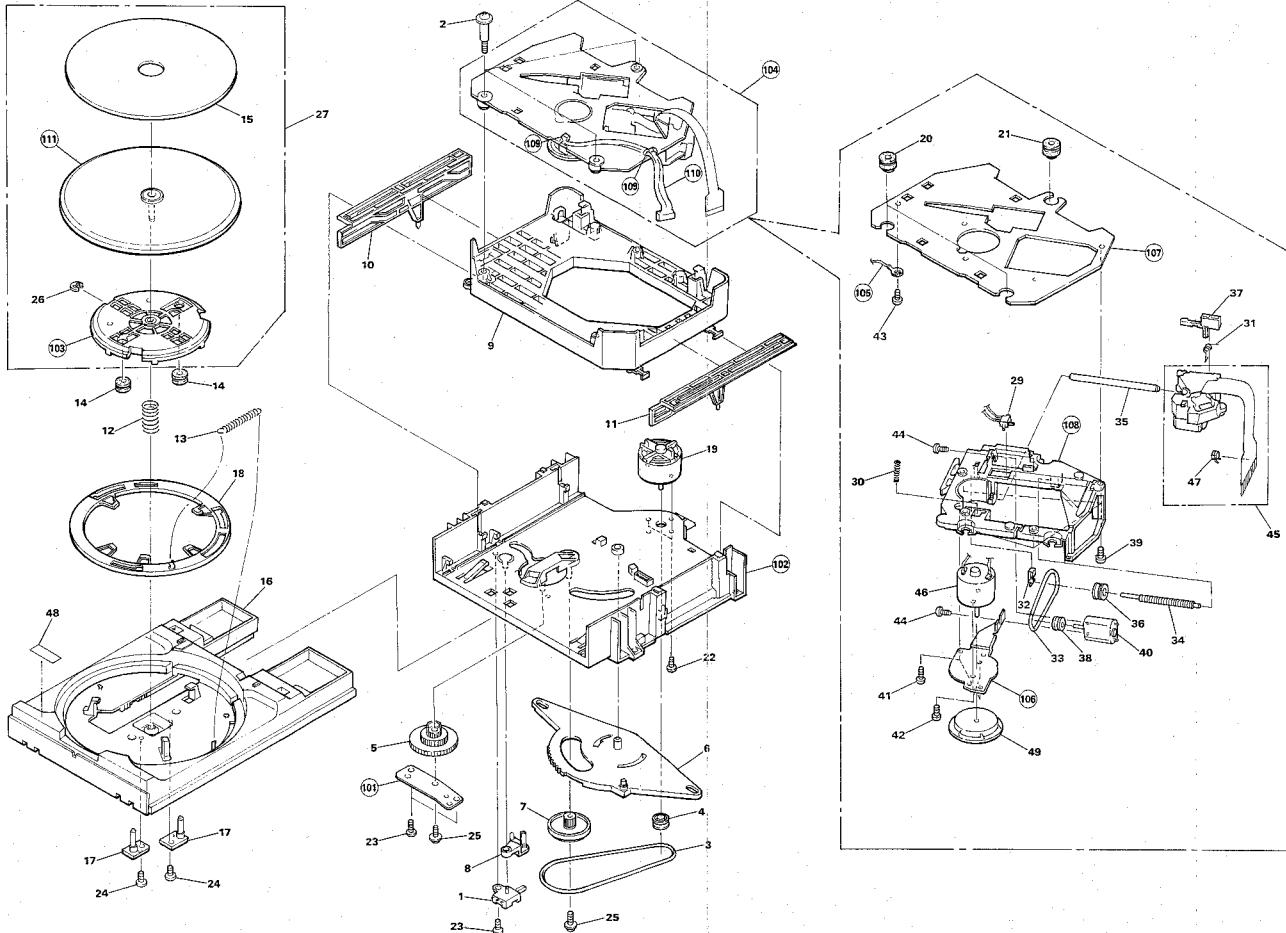
#### Parts List of Exterior

Mark	No.	Description	Parts No.	Mark	No.	Description	Parts No.
▲ ●	1	Mother board assembly	PWM1448		101	Name plate(ABS)	
▲	2	Strain relief	CM-22C		102	SW board assembly	
▲	3	AC power cord	PDG1015		103	Under base	
▲	4	Power transformer S(AC120V)	PTT1179		104	Audio angle	
▲	5	Power transformer A(AC120V)	PTT1183		105	Rear base	
	6	Stopper	PNM1134		106	Headphone angle	
	7	Insulator	PNW2020		107	Spacer	
	8	Cord clammer	RNH-184		108	Loading mechanism assembly	
	9	Power button	PAC1569		109	Front panel	
	10	Select button	PAC1570		110	Headphone board assembly	
	11	Play button	PAC1571		111	Jack board assembly	
	12	Search button	PAC1572		112	S trans board assembly	
	13	Display window	PAM1503		113	A trans board assembly	
	14	Control panel	PNW1948				
	15	Tray lens	PNW1950				
	16	LED lens	PNW2019				
	17	Tray panel	PNW2025				
	18	Slide knob	RAC1428				
	19	Knob C	RAC1608				
	20	BJAS lens	RNK1674				
●	21	Front panel assembly	PEA1164				
●	22	Bonnet	PYY1148				
●	23	Audio board assembly	PWZ2118				
●	24	Operate board assembly	PWZ2112				
●	25	Screw	BBT30P080FZK				
	26	Screw	BBZ30P060FMC				
	27	Screw	BBZ30P060FCC				
	28	Screw	BBZ30P080FCC				
	29	Screw	BBZ30P120FMC				
	30	Screw	BBZ30P120FMC				
	31	Screw	FBT40P080FZK				
	32	Screw	IBZ30P060FCC				
	33	Screw	IBZ30P080FCC				
	34	Screw	IBZ30P150FCC				
	35	Screw	PDZ30P060FCC				

\* The stopper consist of the big ring part and the small ring part.  
If you stick the stopper to the leg, stick the big ring part to the front leg, and the small ring part to the rear leg.





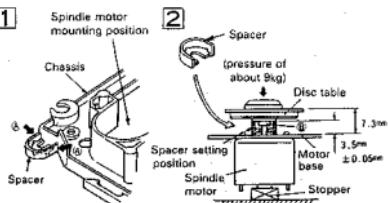


## Parts List of Mechanism section

Mark	No.	Description	Parts No.	Mark	No.	Description	Parts No.
1	Lever switch	DSK1003		101	Shaft holder		
2	Screw(steel)	PBA1027		102	Loading base		
3	Rubber belt	PEB11186		103	Table bearings assembly		
4	Motor pulley	PNW1634		104	Servo mechanism assembly		
5	Drive gear	PNW1996		105	Earth lead unit(300V)		
6	Timing lever	PNW1997		106	Motor base		
7	Gear pulley	PNW1998		107	Mechanism base		
8	SW head	PNW1999		108	Mechanism chassis		
9	Float base	PNW2000		109	Clamper		
10	Left cam	PNW2001		110	Connector assembly		
11	Right cam	PNW2002		111	Turn table(AL)		
12	Compression spring	PBH1120					
13	Tension spring	PBH1121					
14	Float(rubber)	PEB1014					
15	Table rubber sheet	PEB1181					
16	Tray	PNW2003					
17	Table guide	PNW2004					
18	Lock plate	PNW2005					
19	DC motor(0.75W)	PXM1010					
20	Rubber bush	PEB1031					
21	Rubber bush	PEB1170					
22	Screw	BMZ26P040FMC					
23	Screw	BPZ26P060FMC					
24	Screw	BPZ26P060FMC					
25	Screw	IPZ20P080FMC					
26	Stop ring	YE20S					
27	Turn table assembly	PEA1165					
29	Push switch	DSG1014					
30	Spring	PBH1009					
31	Spring	PBH1084					
32	Plate spring	PBK1057					
33	Belt(square)	PEB1072					
34	Screw	PLA1003					
35	Guide bar	PLA1071					
36	Pulley	PNW1066					
37	Half nut	PNW1605					
38	Motor pulley	PNW1634					
39	Screw	PBZ30P080FMC					
40	DC motor(1.7W)	PXM1013					
41	Screw	BPZ20P080FZK					
42	Screw	JFZ20P025FMC					
43	Screw	PBZ30P060FMC					
44	Screw	PMZ20P030FMC					
45	Pick up assembly	PEA1030					
46	DC motor assembly(With oil)	PEA1156					
47	Semi-fixed VR(3.3K)	PCP1008					
48	Caution label	PRW1244					
49	Disc table	PNW1067					

## • How to install the disc table

- 1 Use nippers or other tool to cut the two sections marked ④ in figure ①. Then remove the spacer.
- 2 While supporting the spindle motor shaft with the stopper, put spacer on top of the motor base (angled so it doesn't touch section ④), and stick the disc table on top (takes about 9kg pressure). Take off the spacer.



### 2.3 REMOVE THE TRAY PANEL AND THE TRAY LENS

Hold the tray panel with your hands as the figure shown right, and grasp the tray with your thumbs and then lift the tray panel up while pulling it toward you with the other fingers. (Figs. 1 and 2)

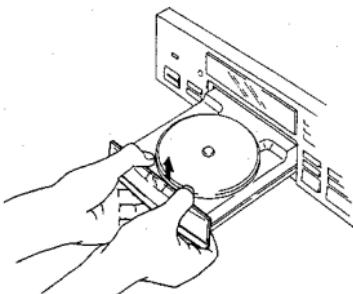


Fig. 1

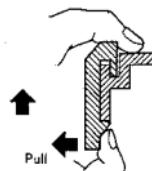


Fig. 2

### 2.4 INSTALL THE TRAY PANEL AND THE TRAY LENS

Align the tray panel with the grooves located at both edges of the tray while holding the tray lens with you fingers, and then press it down till it stops. (Fig. 3)

Hold the tray panel and the tray as shown in Fig. 4 and slide them down till you hear a click sound while pressing strongly with your thumbs. (Figs. 4 and 5)

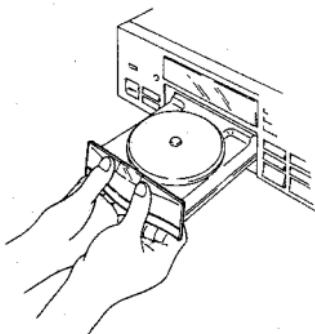


Fig. 4

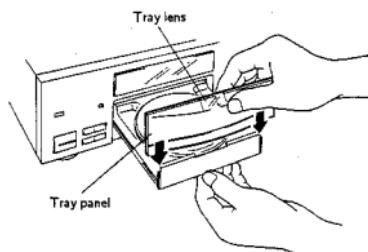


Fig. 3

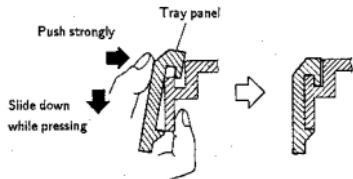


Fig. 5

### 3. P.C.B.'s PARTS LIST

#### NOTES :

- Parts without part number cannot be supplied.
- Parts marked by "●" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.
- The ▲ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- When ordering resistors, first convert resistance values into code form as shown in the following examples.

Ex.1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J = 5%, and K = 10%).

560Ω 56 × 10<sup>2</sup> 561 ..... RD1/4PS5[6]1J

47kΩ 47 × 10<sup>3</sup> 473 ..... RD1/4PS4[7]3J

0.5Ω 0R5 ..... RD2H0[R]5K

1Ω 010 ..... RD1P0[1]0K

Ex.2 When there are 3 effective digits (such as in high precision metal film resistors).  
5.62kΩ 562 × 10<sup>3</sup> 5621 ..... RD1/4SR5[6]21F

Mark	No.	Description	Parts No.	Mark	No.	Description	Parts No.
<b>● MOTHER BOARD ASSEMBLY</b>							
(PWM1448 : PD-31/KU type)							
(PWM1449 : PD-8700/HEM, HB, SD and PD-8700-S/HEWM types)							
<b>SEMICONDUCTORS</b>							
▲	IC22 REGULATOR IC	M5298P		C104	ELECTR.CAPACITOR	CEAS101M10	
	IC101 PRE AMP IC	CXA1471S		C110	CERAMIC CAPACITOR	CKCYF103Z50	
	IC151 SERVO IC	CXA1272S		C151-C153 ELECTR.CAPACITOR	CEAS101M10		
▲	IC201,IC202 POWER OP-AMP,IC	LA6520		C155	CERAMIC CAPACITOR	CKCYB182K50	
	IC301 EFM DEMODULATION IC	CXD2500AQ		C156	CERAMIC CAPACITOR	CGCYX333K25	
	Q101 TRANSISTOR	2SA854S		C157	CERAMIC CAPACITOR	CGCYX103K25	
	Q321,Q351 TRANSISTOR	DTC124ES		C158,C159 CERAMIC CAPACITOR	CGCYX104K25		
	Q381 TRANSISTOR	2SC1740S		C160	ELECTR.CAPACITOR	CEAS4R7M50	
	Q406 TRANSISTOR	DTA124ES		C161	CERAMIC CAPACITOR	CGCYX104K25	
				C162	ELECTR.CAPACITOR	CEAS010M50	
▲	D11-D14,D52 DIODE	11ES2		C163	CERAMIC CAPACITOR	CGCYX104K25	
	D54 ZENER DIODE	MT2181B		C164	CERAMIC CAPACITOR	CGCYX103K25	
	D301 DIODE	ISS254		C167	CERAMIC CAPACITOR	CKCYF103Z50	
	D391-D394 DIODE(PWM1448 only)	ISS254		C168	CERAMIC CAPACITOR	CGCYX333K25	
	D395-D397 DIODE	ISS254		C169	CERAMIC CAPACITOR	CGCYX103K25	
▲	D11-D14,D52 DIODE	11ES2		C170	CERAMIC CAPACITOR	CKCYB332K50	
	D54 ZENER DIODE	MT2181B		C171,C172 CERAMIC CAPACITOR	CKCYB472K50		
	D301 DIODE	ISS254		C202,C207 CERAMIC CAPACITOR	CKCYF103Z50		
	D391-D394 DIODE(PWM1448 only)	ISS254		C212	CERAMIC CAPACITOR	CKCYB272K50	
	D395-D397 DIODE	ISS254		C216,C217 ELECTR.CAPACITOR	CEAS330M16		
<b>COILS</b>				C301	CERAMIC CAPACITOR	CGCYX104K25	
	L391,L392 AXIAL INDUCTOR	LAUR22K		C302	ELECTROLYTIC CAPACIT	CEAS471M6R3	
	L393,L394 AXIAL INDUCTOR	LAU010K		C304	CERAMIC CAPACITOR	CKCYB152K50	
<b>CAPACITORS</b>				C307	CERAMIC CAPACITOR	CGCYX473K25	
	C11,C13 CERAMIC CAPACITOR	CKCYF103Z50		C308	CERAMIC CAPACITOR	CGCYX103K25	
	C15,C16 CERAMIC CAPACITOR	CKCYF103Z50		C309	ELECTR.CAPACITOR	CEASR47M50	
	C25 ELECTR.CAPACITOR	CEAS332M16		C310	CERAMIC CAPACITOR	CKCYF103Z50	
	C26 ELECTR.CAPACITOR	CEAS222M16		C321	CERAMIC CAPACITOR	CGCYX104K25	
	C27 ELECTROLYTIC CAPACIT	CEAS471M6R3		C324	CERAMIC CAPACITOR	CKCYF103Z50	
	C28 ELECTR.CAPACITOR	CEAS101M10		C361	CERAMIC CAPACITOR	CKCYF103Z50	
	C52 ELECTR.CAPACITOR	CEAS101M35		C362	CERAMIC CAPACITOR	CKCYB102K50	
	C60 ELECTR.CAPACITOR	CEAS101M50		C397	CERAMIC CAPACITOR	CKCYF103Z50	
	C101,C102 ELECTR.CAPACITOR	CEAS101M10					
	C103 CERAMIC CAPACITOR	CCCCH200J50					
<b>RESISTORS</b>							
				VR102	VR	VRTB6VS223	
				VR103	VR	VRTB6VS102	
				VR151,VR152	VR	VRTB6VS223	
				Other resistors		RD1/6PM[ ]	

Mark No.	Description	Parts No.	Mark No.	Description	Parts No.
<b>OTHERS</b>			<b>CAPACITORS</b>		
CN101 CONNECTOR	52045-1610		C503, C504 CERAMIC CAPACITOR		CKCYF103Z50
CN404 CONNECTOR(7P)	KPC7				
JA301 OPTICAL OUTPUT JACK	TOTX178		<b>RESISTORS</b>		
JA391,JA392 JACK/12V	PKN1004		VR501 VARIABLE RESISTOR WITH MOTOR 20KB		PCS1066
	(PWNM1448 only)		Other resistors		RD1/6PM□□□J
JA393 JACK	PKN1005				
<b>● OPERATE BOARD ASSEMBLY (PWZ2112)</b>					
<b>SEMICONDUCTORS</b>			<b>JACK BOARD ASSEMBLY</b>		
IC701 MICROCOMPUTER,IC	PD4329A		<b>COILS</b>		
Q801,Q802 TRANSISTOR	2SD2144S		L501-L503 AXIAL INDUCTOR		LAU010K
Q803,Q804 TRANSISTOR	2SB1296				
Q805,Q806 TRANSISTOR	2SD2144S		<b>CAPACITORS</b>		
Q807-Q809 TRANSISTOR	DTA124ES		C505-C507 CERAMIC CAPACITOR		CKCYF103Z50
Q810 TRANSISTOR	DTC124ES				
D701-D714 DIODE	1SS254		<b>OTHERS</b>		
<b>SWITCHES</b>			JA501 JACK		PKN1001
S701-S742 SWITCH	PSG1006				
1-20, PGM, DELETE, CHECK, CLEAR, >20, RESERVE, REPEAT, TIME, RND, PEAK SEARCH, 0/L, HI LITE SCAN, AUTO SPACE, COMPU, TIME FADE, <<, >>, □, □, □, STOP(□), PLAY(>)					
<b>CAPACITORS</b>			<b>● AUDIO BOARD ASSEMBLY (PWZ2118)</b>		
C701 ELECTR.CAPACITOR	CEAS330M16		<b>SEMICONDUCTORS</b>		
C702-C714 AXIAL CAPACITOR	CKPUBYB221K50		IC801,IC802 D/A CONVERTER,IC		PD2026A
<b>RESISTORS</b>			IC803 LOGIC IC		TC74HC04AP
All resistors	RD1/6PM□□□J		IC808,IC809 OP-AMP IC		NJM6532DD
<b>OTHERS</b>			IC901 REGULATOR IC		NJM78L12A
PHOTO SENSOR UNIT	GP1U50X		IC902 REGULATOR IC		NJM79L12A
V701 FL INDICATOR TUBE	PEL1057		IC903 REGULATOR IC		NJM7805FA
X701 CERAMIC RESONATOR	VSS1014		▲ D802-D804,D80 DIODE		1SS254
<b>SW BOARD ASSEMBLY</b>			▲ D901-D908 DIODE		11ES2
<b>SEMICONDUCTORS</b>			<b>CAPACITORS</b>		
D715 LED	PCX1018		C601,C602 CERAMIC CAPACITOR		CCCCH120J50
<b>SWITCHES</b>			C605,C607 AUDIO FILM CAPACITOR		CFTXA104J50
S743-S748 SWITCH (ON/STN BY, FADE IN(¬), FADE OUT(¬), ←, →, DISPLAY OFF)	PSG1006		C609,C811 AUDIO FILM CAPACITOR		CFTXA104J50
S749	RSH1017		C812,C813 CERAMIC CAPACITOR		CCCCH390J50
<b>RESISTORS</b>			C819,C820 CERAMIC CAPACITOR		CCCCH390J50
R710 CARBON FILM RESISTOR	RD1/6PM103J		C821 AUDIO FILM CAPACITOR		CFTXA681J50
<b>HEADPHONE BOARD ASSEMBLY</b>			C822 AUDIO FILM CAPACITOR		CFTXA682J50
<b>SEMICONDUCTORS</b>			C824 ELECTR.CAPACITOR		CEAS470M50
IC501 OP-AMP,IC	M5218AL		C825 PL.STYRENE CAPACITOR		CQSA102J50
			C828,C830 AUDIO FILM CAPACITOR		CFTXA104J50
			C832,C834 AUDIO FILM CAPACITOR		CFTXA104J50
			C835,C836 CERAMIC CAPACITOR		CCCCH390J50
			C839,C840 CERAMIC CAPACITOR		CCCCH390J50
			C841 AUDIO FILM CAPACITOR		CFTXA562J50
			C842 AUDIO FILM CAPACITOR		CFTXA681J50
			C843 ELECTR.CAPACITOR		CEAS470M50
			C844-C846 PL.STYRENE CAPACITOR		CQSA102J50
			C860,C861 ELECTR.CAPACITOR		CEAS330M16
			C863,C864 CERAMIC CAPACITOR		CKCYF103Z50
			C870 ELECTROLYTIC CAPACIT		CEAS471M6R3
			C901,C902 ELECTR.CAPACITOR		CEAS102M25
			C903,C904 ELECTR.CAPACITOR		CEAS471M16
			C905 ELECTR.CAPACITOR		CEAS332M16
			C906 ELECTR.CAPACITOR		CEAS102M16
			C914-C919 CERAMIC CAPACITOR		CKCYF103Z50

Mark	No.	Description	Parts No.
<b>RESISTORS</b>		All resistors	RD1/6PM□□□J
<b>OTHERS</b>			
	CN801	CONNECTOR(9P)	KPC9
	JA801	JACK	PKB1010
	JA802	JACK	PKB1010
	X801	XTAL RES (OSC)	PSS1006

## S. TRANS BOARD ASSEMBLY

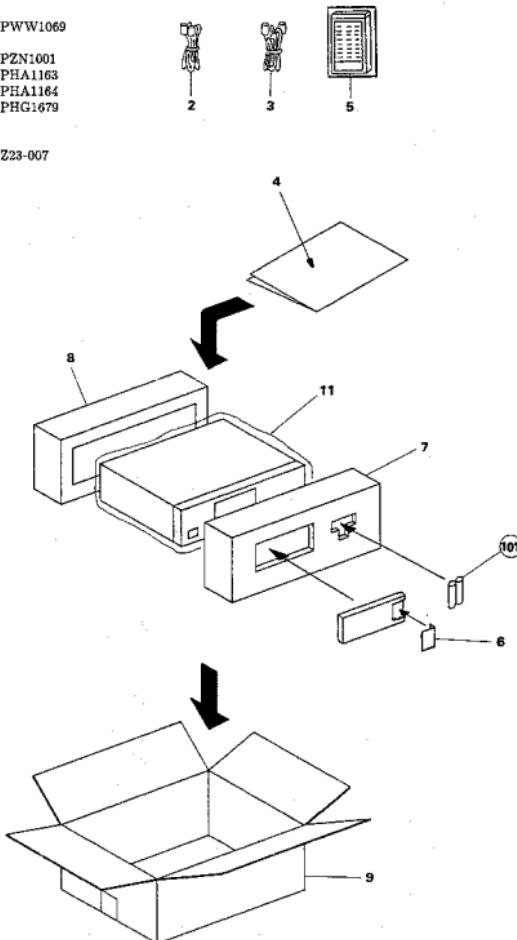
No electrical parts are supplied this assembly.

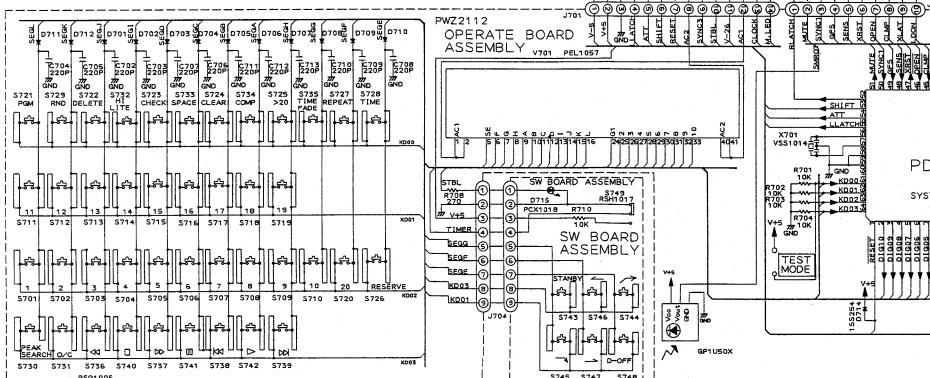
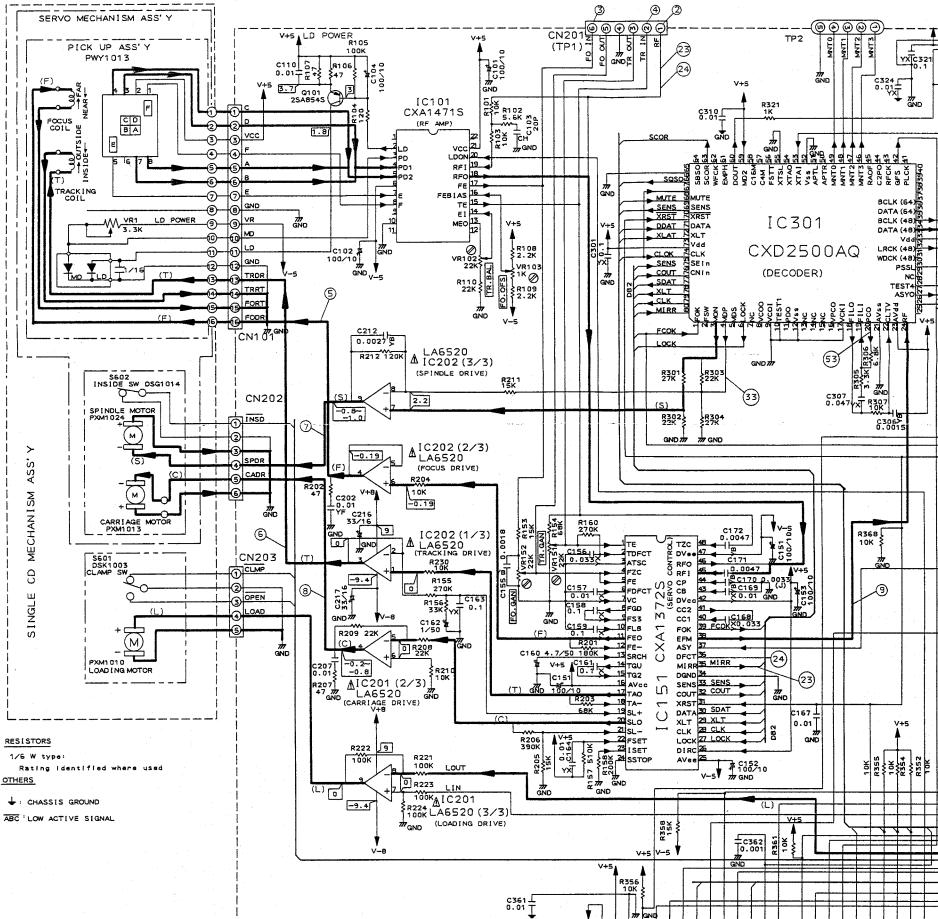
## A. TRANS BOARD ASSEMBLY

No electrical parts are supplied this assembly.

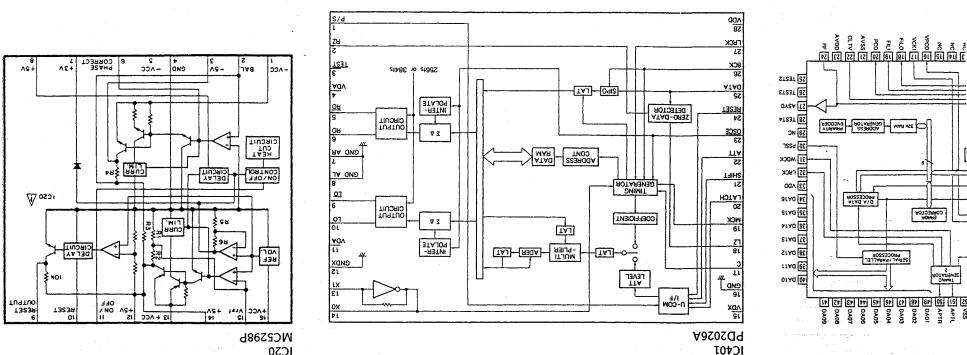
## 4. PACKING

Mark	No.	Description	Parts No.
1			
2		Cord with plug(mini plug)	PDE-319
3		Cord with plug	PDE1001
4		Operating instructions (English)	PRB1151
5		Remote control unit (CU-PD053)	PWW1069
6		Battery lid	PZN1001
7		Styrol protector F	PHA1163
8		Styrol protector R	PHA1164
9		CD Packing case	PHG1679
10			
11		Sheet	Z23-007
101		Mangan battery(R03, AAA)	









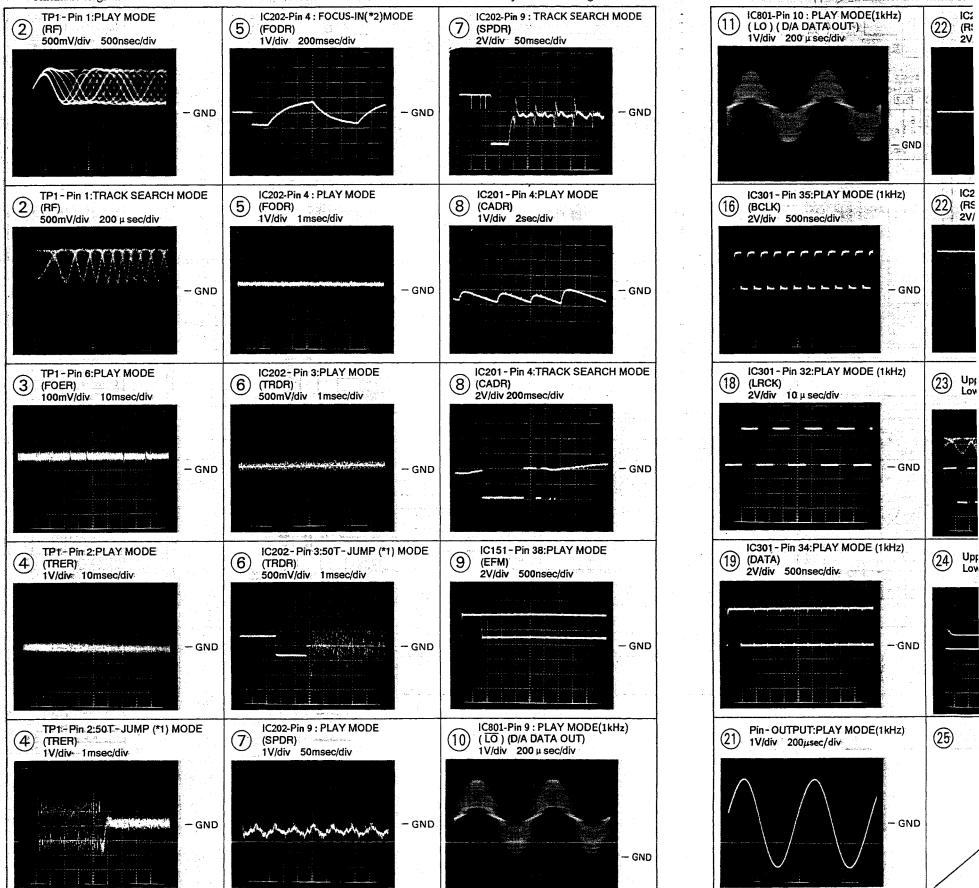
## 5. SCHEMATIC DIAGRAM AND P.C.BOARDS CONNECTION DIAGRAM

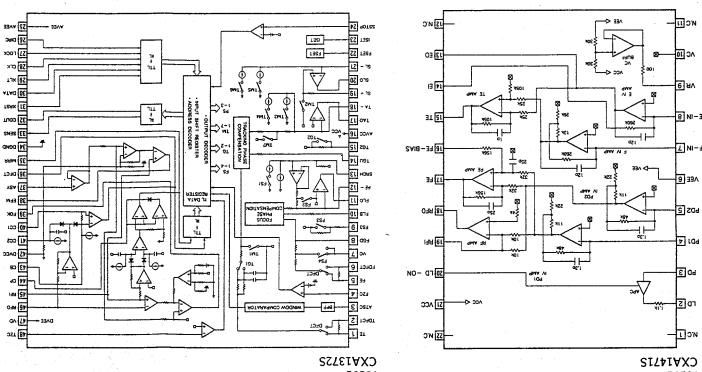
### 5.1 Wave Forms

Note: The encircled numbers denote measuring in the schematic diagram.

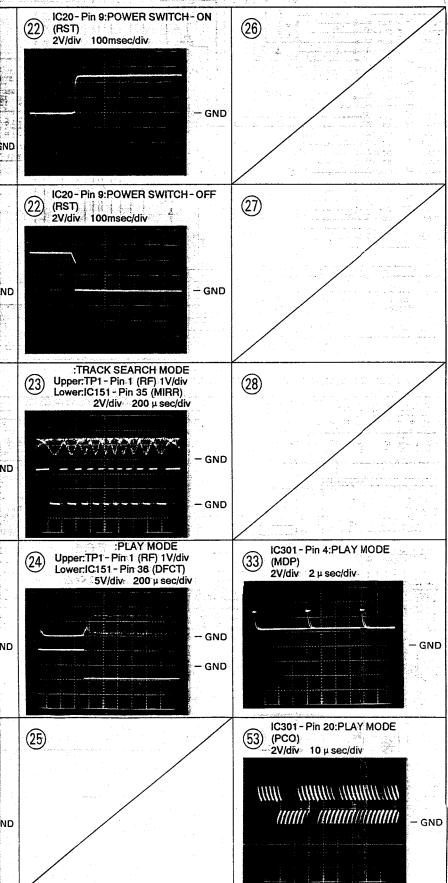
\*1 SOT - JUMP: After switching to the pause mode, press the manual search key.

\*2 FOCUS - IN: Press the key without loading a disc.





## • IC BLOCK DIAGRAM



## 1. RESISTORS:

Indicated in  $\Omega$ ; 1/4W, 1/8W, 1/16W,  $\pm 5\%$  tolerance unless otherwise noted  
k;  $k\Omega$ ; M;  $M\Omega$  (F);  $\pm 1\%$  (G);  $\pm 2\%$  (K);  $\pm 10\%$  (M);  $\pm 20\%$  tolerance.

## 2. CAPACITORS:

Indicated in capacity ( $\mu F$ )/voltage(V) unless otherwise noted p; pF. Indication without voltage is 50V except electrolytic capacitor.

## 3. VOLTAGE, CURRENT:

$\square$  DC voltage (V) at play state.  
 $\square_{DC}$  DC current at play state.  
Value in  $\square$  is DC current at stop state.

## 4. OTHERS:

→: Signal route.  
◎: Adjusting point.

The number marked on same component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.  
※ marked capacitors and resistors have parts numbers.

This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.

## 5. SWITCHES: (The underlined indicates the switch position)

SWITCH BOARD ASSEMBLY

S743: POWER ON-OFF

## OPERATE BOARD ASSEMBLY

S701: 1	S725: >20
S702: 2	S726: RESERVE
S703: 3	S727: REPEAT
S704: 4	S728: TIME
S705: 5	S729: RND
S706: 6	S730: PEAK SEARCH
S707: 7	S731: 0/1
S708: 8	S732: HI LITE SCAN
S709: 9	S733: COOL SPACE
S710: 10	S734: COMPR
S711: 11	S735: TIME FADE ] EDI
S712: 12	S736: <> ] TIME FADE
S713: 13	S737: <> ] MANUAL SEARCH
S714: 14	S738: KK ] TRACK SEARCH
S715: 15	S739: KK ]
S716: 16	S740: STOP(□)
S717: 17	S741: PAUSE(■)
S718: 18	S742: PLAY(▶)
S719: 19	S743: ON/STN(BY)
S720: 20	S744: FADE (N/)
S721: PGM	S745: FADE OUT(¬)
S722: DELETE	S746: — ] INDEX
S723: CHECK	S747: — ]
S724: CLEAR	S748: DISPLAY OFF

## Line Voltage Selection (For HB, HEM and HEWM types)

Line voltage can be changed with the following steps.

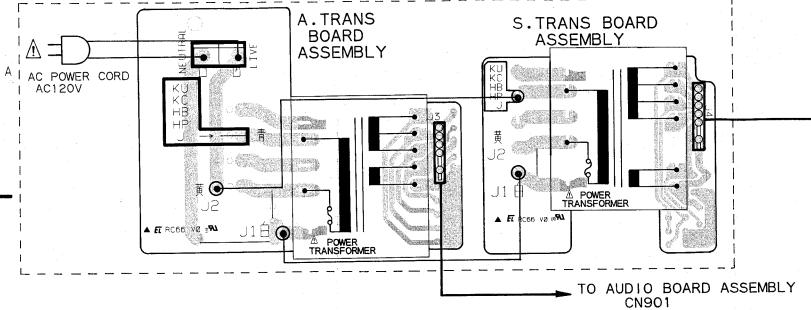
1. Disconnect the AC power cord.
2. Remove the top cover.
3. Change the position of the jumper wire A as follows

Voltage	Jumper wire A position
220V	a
240V	b

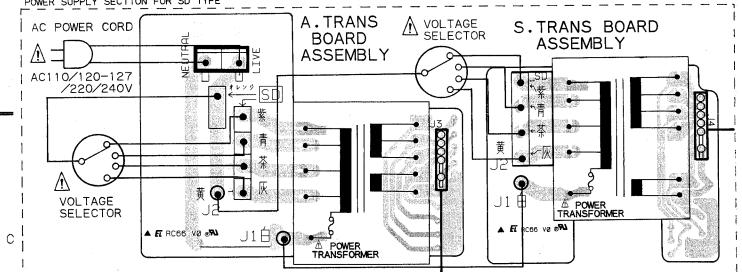
4. Stick the line voltage label on the rear panel.

Parts No.	Description
AXX-193	220V label
AXX-192	240V label

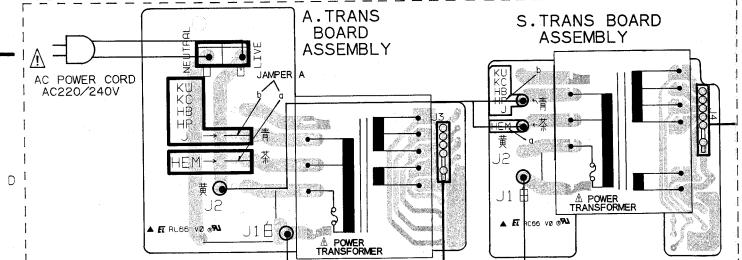
## POWER SUPPLY SECTION FOR KU TYPE



## POWER SUPPLY SECTION FOR SD TYPE



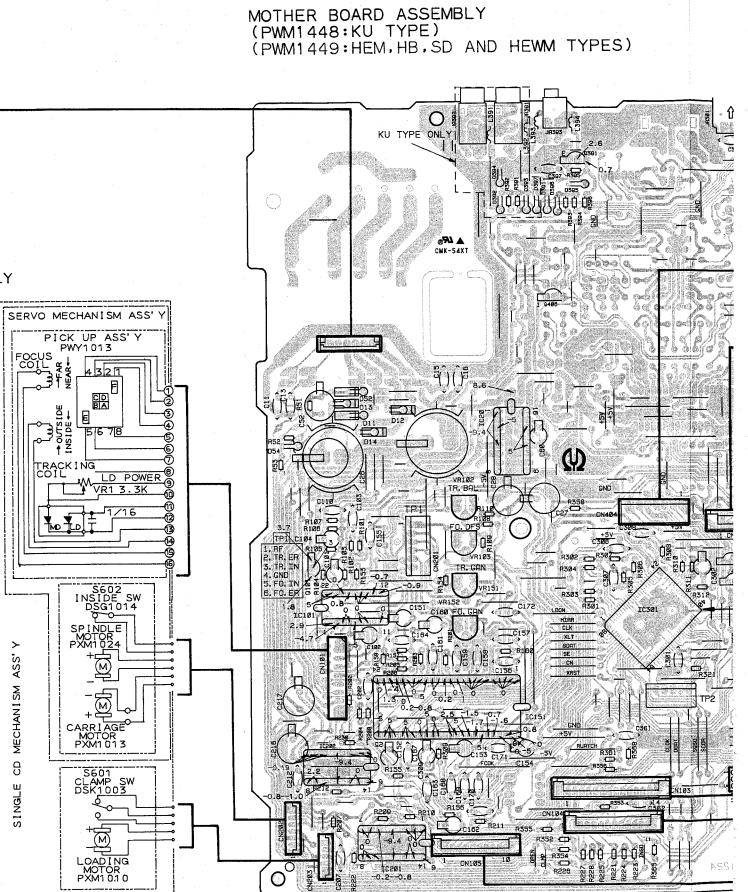
## POWER SUPPLY SECTION FOR HEM,HB AND HEWM TYPES



## MOTHER BOARD ASSEMBLY

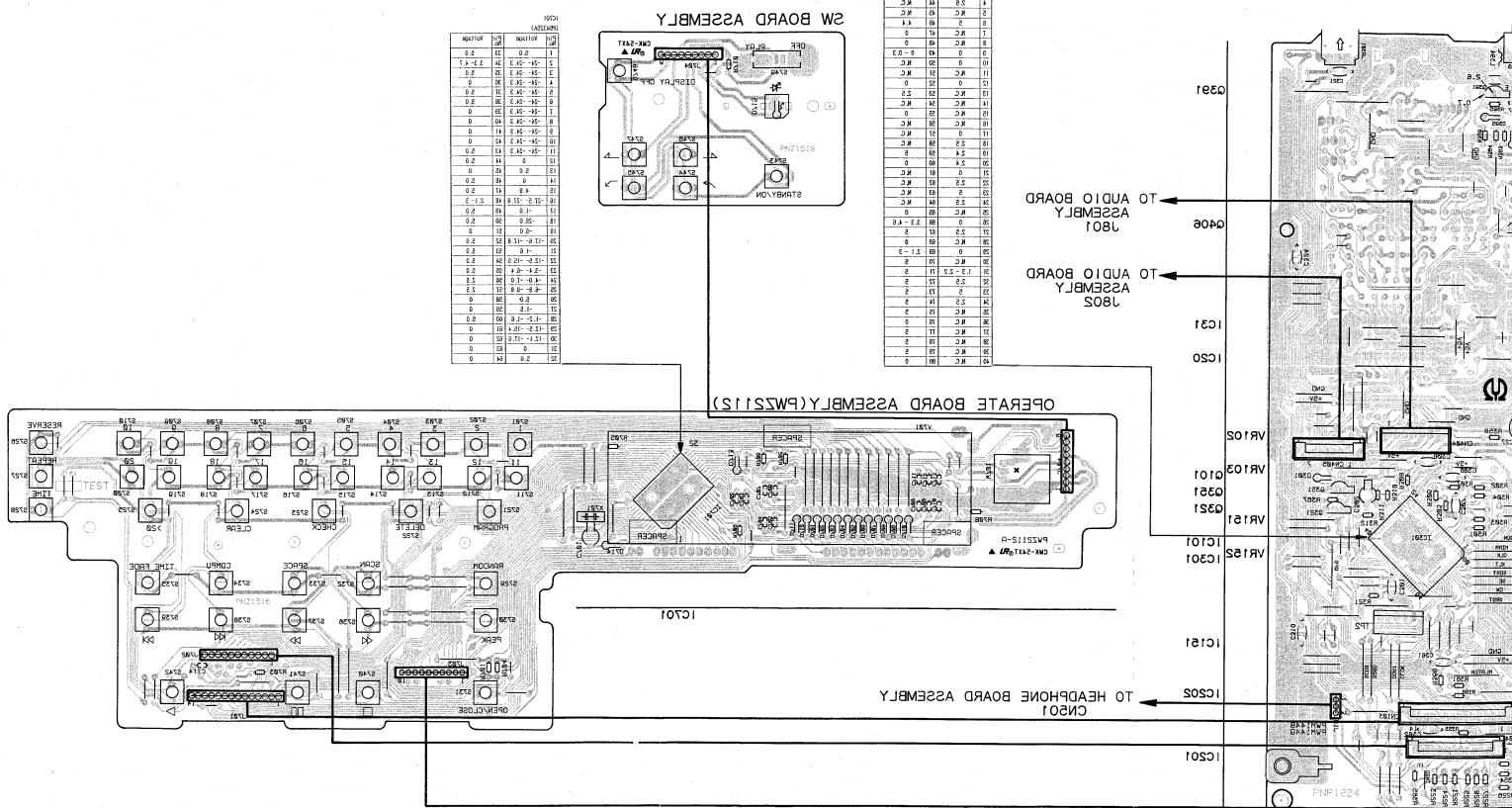
(PWM1448:KU TYPE)

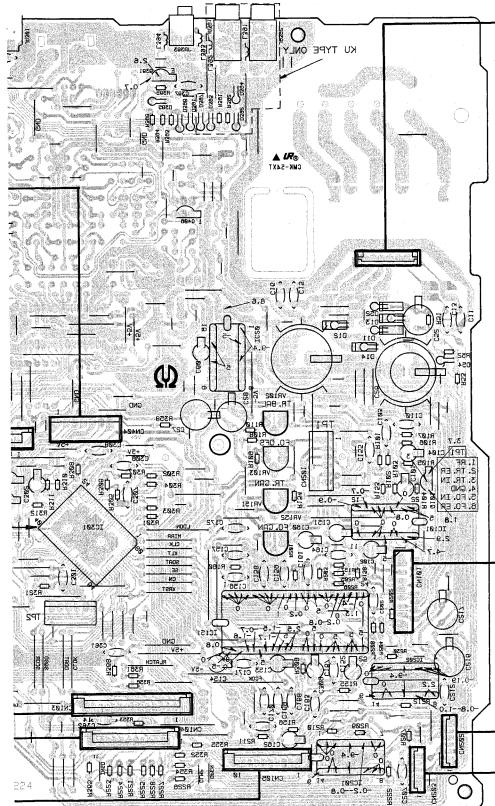
(PWM1449:HEM,HB,SD AND HEWM TYPES)



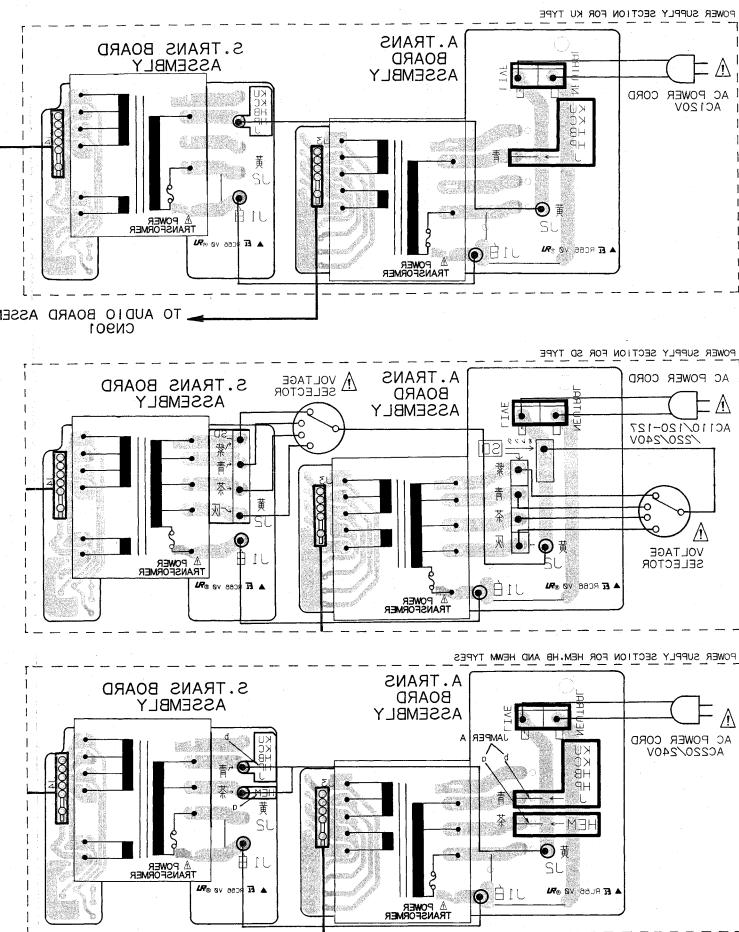


This P.C.B. connection diagram is viewed from the foil side.



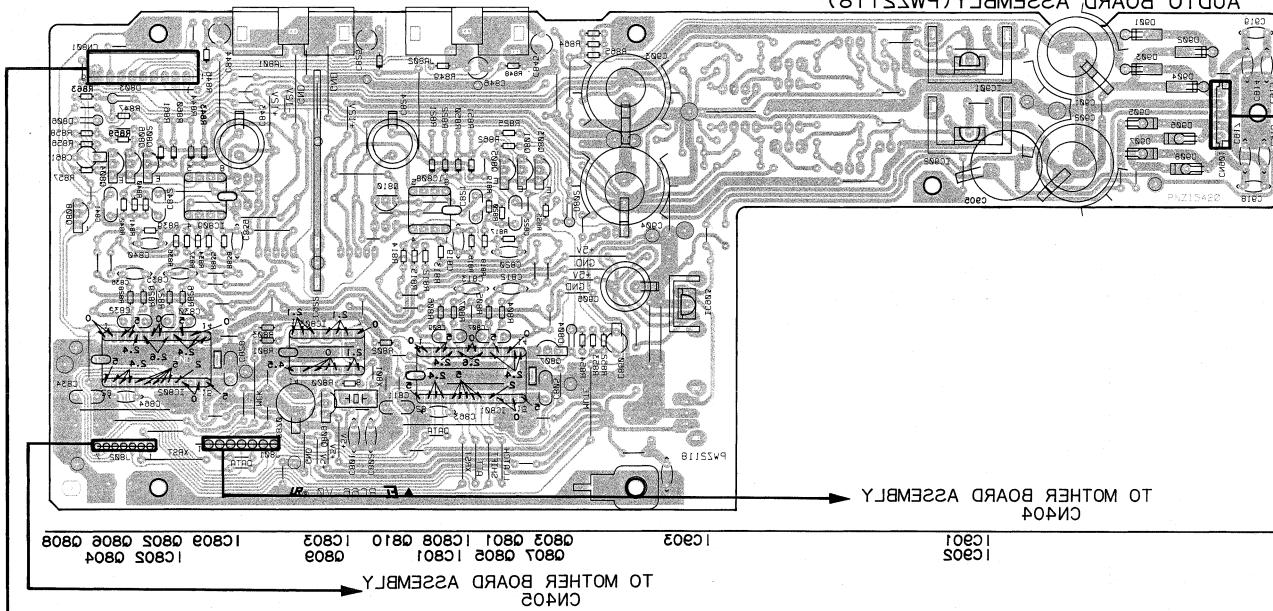


(PMWI 448:HEM,HB,SD AND HEMM TYPES)  
(PMWI 448:KU TYPE)  
MOTHER BOARD ASSEMBLY

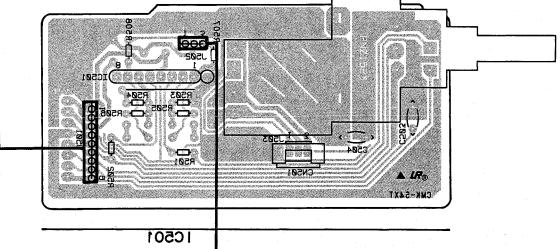


This P.C.B. connection diagram is viewed from the foil side.

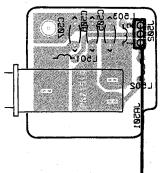
AUDIO BOARD ASSEMBLY (PM25118)



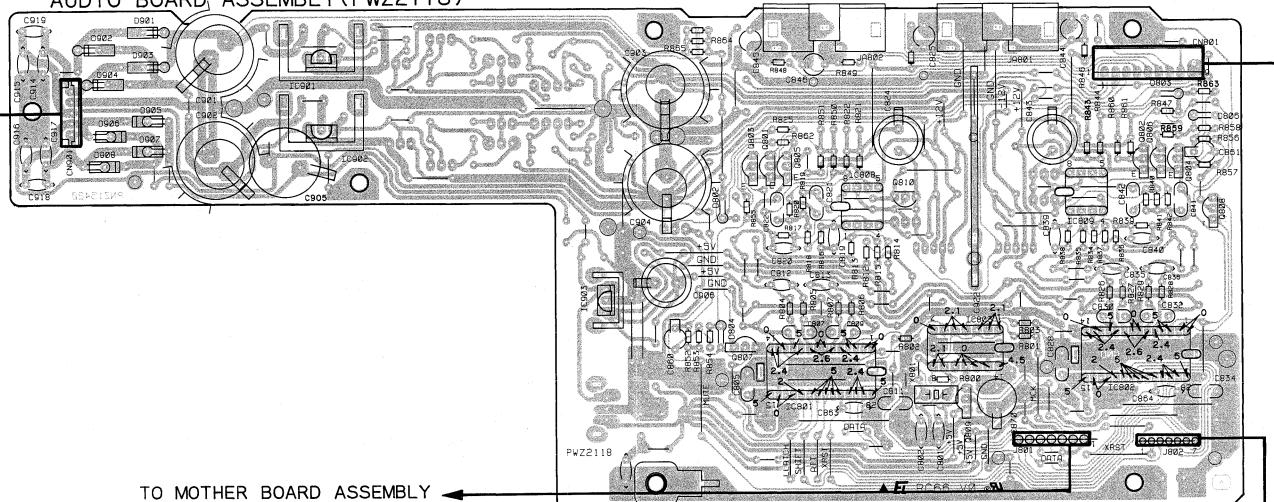
## HEADPHONE BOARD ASSEMBLY



## ASSEMBLY JACK BOARD



AUDIO BOARD ASSEMBLY (PWZ2118)



TO MOTHER BOARD ASSEMBLY  
CN404

IC901  
IC902

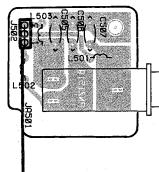
IC903

Q803 Q801 IC808 Q810 IC803  
Q807 Q805 IC801 Q809

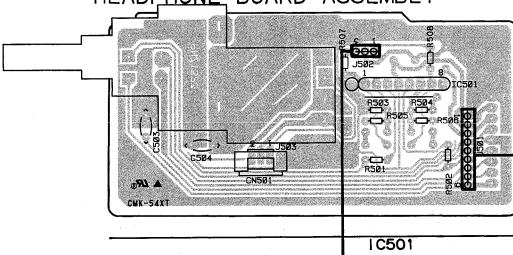
IC809 Q802 Q806 Q808  
IC802 Q804

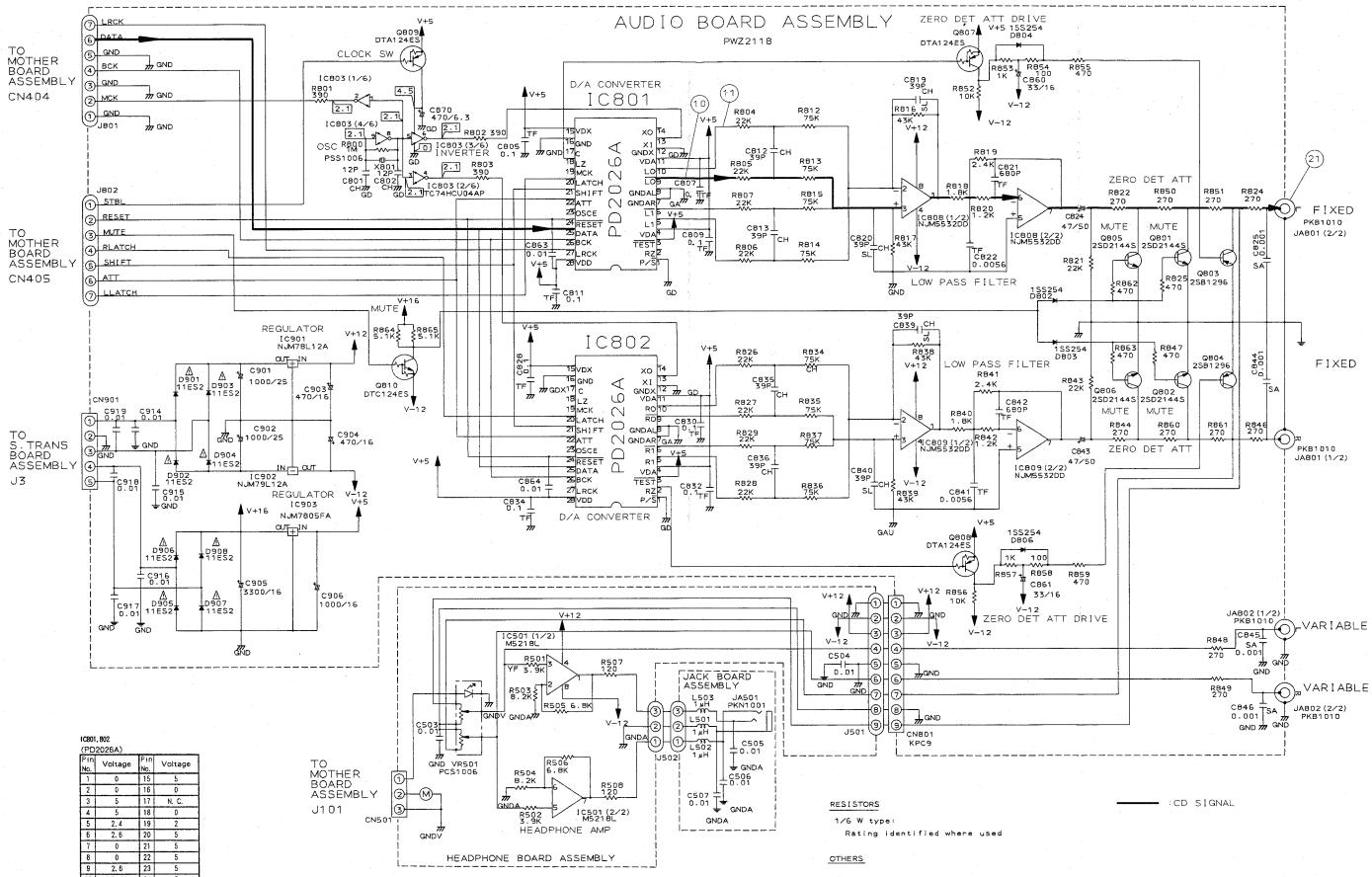
TO MOTHER BOARD ASSEMBLY  
CN405

JACK BOARD ASSEMBLY



HEADPHONE BOARD ASSEMBLY





IC801, 802 (PD2026A)			
Pin No.	Voltage	Pin No.	Voltage
1	0	15	5
2	0	16	0
3	5	17	N.C.
4	5	18	0
5	2.4	19	2
6	2.6	20	5
7	0	21	5
8	0	22	5
9	2.6	23	5
10	2.4	24	5
11	5	25	2.4
12	0	26	2.4
13	2.4	27	2.4
14	2.4	28	5

TO  
MOTHER  
BOARD  
ASSEMBLY  
J101

HEADPHONE BOARD ASSEMBLY

1/6 W type:

REVIEWS

## 6. ADJUSTMENTS

### 6.1 ADJUSTMENT METHODS

If a disc player is adjusted incorrectly or inadequately, it may malfunction or not work at all even though there is nothing at all wrong with the pickup or the circuitry. Adjust correctly following the adjustment procedure.

#### ● Adjustment items/verification items and order

Step	Item	Test point	Adjustment location
1	Focus offset adjustment	TP1, Pin 6(FCS. ERR)	VR103(FCS. OFS)
2	Grating adjustment	TP1, Pin 2(TRK. ERR)	Grating adjustment slit
3	Tracking error balance adjustment	TP1, Pin 2(TRK. ERR)	VR102(TRK. BAL.)
4	Pickup radial/tangential direction tilt adjustment	TP1, Pin 1(RF)	Radial tilt adjustment screw, Tangential tilt adjustment screw
5	RF level adjustment	TP1, Pin 1(RF)	VR1(RF level)
6	Focus servo loop gain adjustment	TP1, Pin 5(FCS. IN) TP1, Pin 6(FCS. ERR)	VR152(FCS. GAN)
7	Tracking servo loop gain adjustment	TP1, Pin 3(TRK. IN) TP1, Pin 2(TRK. ERR)	VR151(TRK. GAN)
8	Focus error signal verification	TP1, Pin 6(FCS. ERR)	_____

#### ● Abbreviation table

FCS. ERR :Focus Error  
 FCS. OFS :Focus Offset  
 TRK. ERR :Tracking Error  
 TRK. BAL :Tracking Balance  
 FCS. GAN :Focus Gain  
 TRK. GAN :Tracking Gain  
 FCS. IN :Focus In  
 TRK. IN :Tracking In

#### ● Measuring instruments and tools

1. Dual trace oscilloscope (10:1 probe)
2. Low-frequency oscillator
3. Test disc (YEDS-7)
4. 12-cm disc (with at least about 70 minutes recording)
5. Low-pass filter (39 k $\Omega$  + 0.001  $\mu$ F)
6. Resistor (100 k $\Omega$ )
7. Hexagonal wrench (M3 mm)
8. Standard tools

#### ● Test point and adjustment variable resistor positions

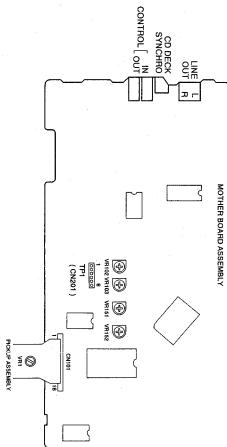


Figure 1 Adjustment Locations

#### ● Notes

1. Use a 10:1 probe for the oscilloscope.
2. All the knob positions (settings) for the oscilloscope in the adjustment procedures are for when a 10:1 probe is used.

#### ● Test mode

These models have a test mode so that the adjustments and checks required for service can be carried out easily. When these models are in test mode, the keys on the front panel work differently from normal. Adjustments and checks can be carried out by operating these keys with the correct procedure. For these models, all adjustments are carried out in test mode.

#### [Setting these models to test mode]

How to set this model into test mode.

1. Unplug the power cord from the AC socket.
2. Short the test mode jumper wires. (See Figure 1.)
3. Plug the power cord back into the AC socket.

When the test mode is set correctly, the display is different from what it usually is when the power is turned on. If the display is still the same as usual, test mode has not been set correctly, so repeat Steps 1 – 3.

**[Release from test mode]**

Here is the procedure for releasing the test mode:

1. Press the STOP key and stop all operations.
2. Unplug the power cord from the AC socket.

**[Operations of the keys in test mode]**

Code	Key name	Function in test mode	Explanation
	PROGRAM	Focus servo close	<p>The laser diode is lit up and the focus actuator is lowered, then raised slowly and the focus servo is closed at the point where the objective lens is focused on the disc.</p> <p>With the player in this state, if you lightly rotate the stopped disc by hand, you can hear the sound the focus servo.</p> <p>If you can hear this sound, the focus servo is operating correctly. If you press this key with no disc mounted, the laser diode lights up, the focus actuator is pulled down, then the actuator is raised and lowered twice and returned to its original position.</p>
▷	PLAY	Spindle servo ON	<p>Starts the spindle motor in the clockwise direction and when the disc rotation reaches the prescribed speed (about 500 rpm at the inner periphery), sets the spindle servo in a closed loop.</p> <p>Be careful. Pressing this key when there is no disc mounted makes the spindle motor run at the maximum speed.</p> <p>If the focus servo does not go correctly into a closed loop or the laser light shines on the mirror section at the outermost periphery of the disc, the same symptom is occurred.</p>
□□	PAUSE	Tracking servo close/open	<p>Pressing this key when the focus servo and spindle servo are operating correctly in closed loops puts the tracking servo into a closed loop, displays the track number being played back and the elapsed time on the front panel, and outputs the playback signal.</p> <p>If the elapsed time is not displayed or not counted correctly or the audio is not played back correctly, it may be that the laser is shining on the section with no sound recorded at the outer edge of the disc, that something is out of adjustment, or that there is some other problem.</p> <p>This key is a toggle key and open/close the tracking servo alternately. This key has no effect if no disc is mounted.</p>

Code	Key name	Function in test mode	Explanation
◀◀	MANUAL SEARCH REV	Carriage reverse (inwards)	Moves the pickup position toward the inner diameter of the disc. When this key is pressed with the tracking servo in a closed loop, the tracking servo automatically goes into an open loop. Since the motor does not automatically stop at the mechanical end point in test mode, be careful with this operation.
▶▶	MANUAL SEARCH FWD	Carriage forward (outwards)	Moves the pickup position toward the outer diameter of the disc. When this key is pressed with the tracking servo in a closed loop, the tracking servo automatically goes into an open loop. Since the motor does not automatically stop at the mechanical end point in test mode, be careful with this operation.
□	STOP	Stop	Switches off all the servos and initialized. The pickup remains where it was when this key was pressed.
△	OPEN/CLOSE	Disc tray open/close	Open/close the disc tray. This key is a toggle key and open/close tray alternately. Pressing this key when the disc is turning stops the disc, then opens the tray. This key operation does not affect the position of the pickup.

**[How to play back a disc in test mode]**

In test mode, since the servos operate independently, playing back a disc requires that you operate the keys in the correct order to close the servos.

Here is the key operation sequence for playing back a disc in test mode.

**PROGRAM**      Lights up the laser diode and closes the focus servo.



**PLAY ▶**      Starts the spindle motor and closes the spindle servo.



**PAUSE ■**      Closes the tracking servo.

Wait at least 2-3 seconds between each of these operations.

## 1. Focus Offset Adjustment

● Objective	Sets the DC offset for the focus error amp.		
● Symptom when out of adjustment	The model does not focus in and the RF signal is dirty.		
● Measurement instrument connections	<p>Connect the oscilloscope to TP1, Pin 6 (FCS. ERR)</p> <p>[Settings] 5 mV/division 10 ms/division DC mode</p>	<p>● Player state</p> <p>● Adjustment location</p> <p>● Disc</p>	<p>Test mode, stopped (just the Power switch on)</p> <p>VR103 (FCS. OFS)</p> <p>None needed</p>

### [Procedure]

Adjust VR103 (FCS. OFS) so that the DC voltage at TP1, Pin 6 (FCS. ERR) is  $-150 \pm 50$  mV.

## 2. Grating Adjustment

● Objective	To align the tracking error generation laser beam spots to the optimum angle on the track.		
● Symptom when out of adjustment	Play does not start, track search is impossible, tracks are skipped.		
● Measurement instrument connections	Connect the oscilloscope to TP1, Pin 2 (TRK. ERR) via a low pass filter. (See Figure 2)  [Settings] 50 mV/division 5 ms/division DC mode	● Player state  ● Adjustment location	Test mode, focus and spindle servos closed and tracking servo open  Pickup grating adjustment slit  12-cm disc. (YEDS-7 can not be used.)

### [Procedure]

1. Move the pickup to the outer edge of the disc with the MANUAL SEARCH FWD  $\gg$  or REV  $\ll$  key.
2. Press the PROGRAM key, then the PLAY  $\triangleright$  key in that order to close the focus servo then the spindle servo.
3. Insert an ordinary screwdriver into the grating adjustment slit and adjust the grating to find the null point. For more details, see the next page.
4. If you slowly turn the screwdriver clockwise from the null point, the amplitude of the wave gradually increases, then if you continue turning the screwdriver, the amplitude of the wave becomes smaller again. Turn the screwdriver clockwise from the null point and set the grating to the first point where the wave amplitude reaches its maximum.

**Reference :** Figure 3 shows the relation between the angle of the tracking beam with the track and the waveform.

**Note :** The amplitude of the tracking error signal is about 3 Vp-p (when a  $39\text{ k}\Omega + 0.001\text{ }\mu\text{F}$  low pass filter is used). If this amplitude is extremely small (2 Vp-p or less), the objective lens or the pickup malfunction may be the cause. If the difference between the amplitude of the error signal at the innermost edge and outermost edge of the disc is more than 10%, the grating is not adjusted to the optimum point, so adjust it again.

5. Return the pickup to more or less midway across the disc with the MANUAL SEARCH REV  $\ll$  key, press the PAUSE  $\square$  key and double check that the track number and elapsed time are displayed on the front panel. If they are not displayed at this time or the elapsed time changes irregularly, double check the null point and adjust the grating again.

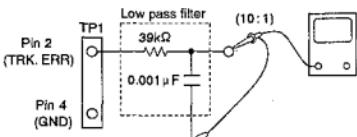
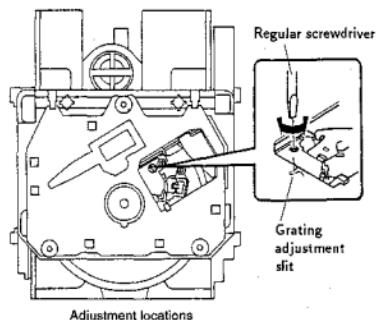


Figure 2



**[How to find the null point]**

When you insert the regular screwdriver into the slit for the grating adjustment and change the grating angle, the amplitude of the tracking error signal at TP1, Pin 2 changes. Within the range for the grating, there are five or six locations where the amplitude of the wave reaches a minimum. Of these five or six locations, there is only one at which the envelope of the waveform is smooth. This location is where the three laser beams divided by the grating are all right above the same track. (See Figure 3.)

This point is called the null point. When adjusting the grating, this null point is found and used as the reference position.

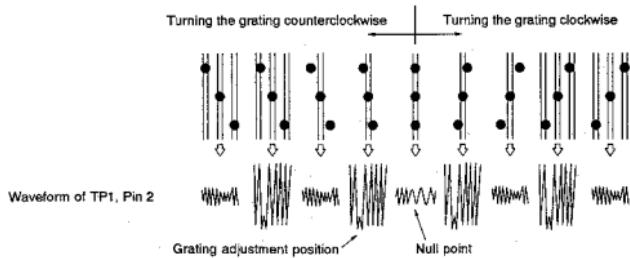
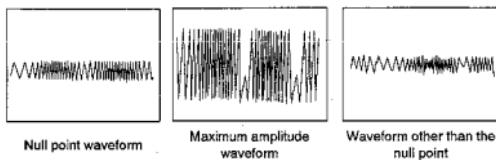


Figure 3

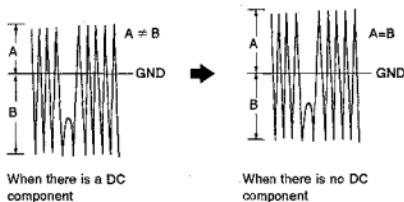


### 3. Tracking Error Balance Adjustment

● Objective	To correct for the variation in the sensitivity of the tracking photodiode.		
● Symptom when out of adjustment	Play does not start or track search is impossible.		
● Measurement instrument connections	<p>Connect the oscilloscope to TP1, Pin 2 (TRK. ERR). This connection may be via a low pass filter.</p> <p>[Settings] 50 mV/division 5 ms/division DC mode</p>	<p>● Player state</p> <p>● Adjustment location</p> <p>● Disc</p>	<p>Test mode, focus and spindle servos closed and tracking servo open</p> <p>VR102 (TRK. BAL)</p> <p>YEDS-7</p>

#### [Procedure]

1. Move the pickup to midway across the disc ( $R=35$  mm) with the MANUAL SEARCH FWD  $\gg$  or REV  $\ll$  key.
2. Press the PROGRAM key, then the PLAY  $\triangleright$  key in that order to close the focus servo then the spindle servo.
3. Line up the bright line (ground) at the center of the oscilloscope screen and put the oscilloscope into DC mode.
4. Adjust VR102 (TRK. BAL) so that the positive amplitude and negative amplitude of the tracking error signal at TP1, Pin 2 (TRK. ERR) are the same (in other words, so that there is no DC component).



## 4. Pickup Radial/Tangential Tilt Adjustment

● Objective	To adjust the angle of the pickup relative to the disc so that the laser beams are shone straight down into the disc for the best read out of the RF signals.		
● Symptom when out of adjustment	Sound broken; some discs can be played but not others.		
● Measurement instrument connections	<p>Connect the oscilloscope to TPI, Pin 1 (RF).</p> <p>[Settings] 20 mV/division 200 ns/division AC mode</p>	<p>● Player state</p> <p>● Adjustment location</p> <p>● Disc</p>	<p>Test mode, play</p> <p>Pickup radial tilt adjustment screw and tangential tilt adjustment screw</p> <p>12-cm disc. (YEDS-7 can not be used.)</p>

## [Procedure]

1. Press the MANUAL SEARCH FWD  $\gg$  or REV  $\ll$  key so that the radial/tangential tilt screws can be adjusted. Press the PROGRAM key, the PLAY  $\triangleright$  key, then the PAUSE  $\|$  key in that order to close the focus servo then the spindle servo and put the player into play mode.
2. First, adjust the radial tilt adjustment screw with a Phillips screwdriver so that the eye pattern (the diamond shape at the center of the RF signal) can be seen the most clearly.
3. Next, adjust the tangential tilt adjustment screw with a Phillips screwdriver so that the eye pattern (the diamond shape at the center of the RF signal) can be seen the most clearly (Figure 5).
4. Adjust the radial tilt adjustment screw and the tangential tilt adjustment screw again so that the eye pattern can be seen the most clearly. As necessary, adjust the two screws alternately so that the eye pattern can be seen the most clearly.

Note: Radial and tangential mean the directions relative to the disc shown in Figure 4.

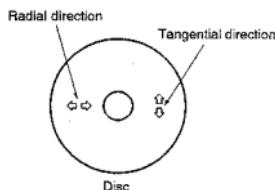
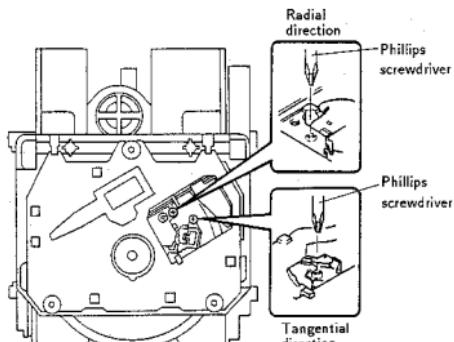


Figure 4



Adjustment locations

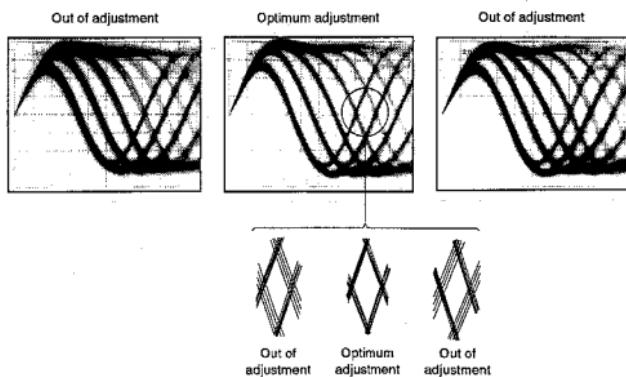


Figure 5 Eye pattern

## 5. RF Level Adjustment

● Objective	To optimize the playback RF signal amplitude		
● Symptom when out of adjustment	No play or no search		
● Measurement instrument connections	<p>Connect the oscilloscope to TPI, Pin 1 (RF).</p> <p>[Settings] 50 mV/division 10 ms/division AC mode</p>	<ul style="list-style-type: none"> <li>● Player state</li> <li>● Adjustment location</li> <li>● Disc</li> </ul>	<p>Test mode, play</p> <p>VR1(laser power)</p> <p>YEDS-7</p>

## [Procedure]

1. Move the pickup to midway across the disc ( $R=35$  mm) with the MANUAL SEARCH FWD  $\gg$  or REV  $\ll$  key, then press the PROGRAM key, then the PLAY  $\triangleright$  key in that order to close the respective servos and put the player into play mode.
2. Adjust VR1 (laser power) so that the RF signal amplitude is  $1.2\text{ Vp-p} \pm 0.1\text{ V}$ .

## 6. Focus Servo Loop Gain Adjustment

● Objective	To optimize the focus servo loop gain.		
● Symptom when out of adjustment	Playback does not start or focus actuator noisy.		
● Measurement instrument connections	See figure 6. [Settings] CH1 20 mV/division X - Y mode	● Player state ● Adjustment location ● Disc	Test mode, play VR152 (FCS. GAN) YEDS-7

### [Procedure]

1. Set the AF generator output to 1.2 kHz and 1 Vp-p.
2. Press the MANUAL SEARCH FWD  $\gg$  or REV  $\ll$  key to move the pickup to halfway across the disc (R=35 mm), then press the PROGRAM key, the PLAY  $\triangleright$  key, then the PAUSE  $\square$  key in that order to close the corresponding servos and put the player into play mode.
3. Adjust VR152 (FCS. GAN) so that the Lissajous waveform is symmetrical about the X axis and the Y axis.

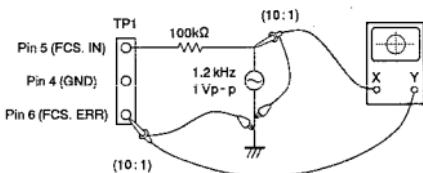
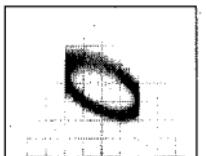
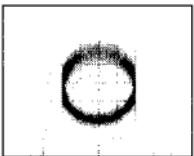


Figure 6

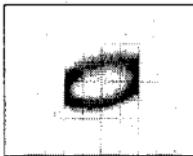
### Focus Gain Adjustment



Higher gain



Optimum gain



Lower gain

## 7. Tracking Servo Loop Gain Adjustment

● Objective	To optimize the tracking servo loop gain.		
● Symptom when out of adjustment	Playback does not start, during searches the actuator is noisy, or tracks are skipped.		
● Measurement instrument connections	See Figure 7. [Settings] CH1                    CH2 50 mV/division    50 mV/division X - Y mode	● Player state ● Adjustment location ● Disc	Test mode, play VR151 (TRK. GAN) YEDS-7

### [Procedure]

1. Set the AF generator output to 1.2 kHz and 2Vp-p.
2. Press the MANUAL SEARCH FWD  $\triangleright$  or REV  $\triangleleft$  key to move the pickup to halfway across the disc ( $R=35$  mm), then press the PROGRAM key, the PLAY  $\triangleright$  key, then the PAUSE  $\|\|$  key in that order to close the corresponding servos and put the player into play mode.
3. Adjust VR151 (TRK. GAN) so that the Lissajous waveform is symmetrical about the X axis and the Y axis.

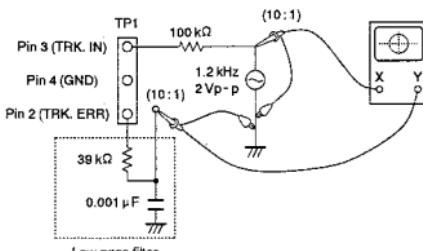
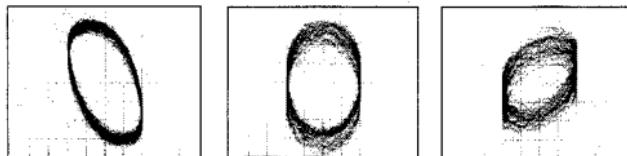


Figure 7

### Tracking Gain Adjustment



## 8. Focus Error Signal (Focus S Curve) Verification

● Objective	To judge whether the pickup is ok or not by observing the focus error signal. The pickup is judged from the amplitude of the tracking error signal (as discussed in the section on adjusting the tracking error balance) and the waveform for the focus error signal.		
● Symptom when out of adjustment			
● Measurement instrument connections	Connect the oscilloscope to TPI, Pin 6 (FCS. ERR).  [Settings] 100 mV/division 5 ms/division DC mode	● Player state  ● Adjustment location  ● Disc	Test mode, stop  None  YEDES-7

### [Procedure]

1. Connect TPI Pin 5 to ground.
2. Mount the disc.
3. While watching the oscilloscope screen, press the PROGRAM key and observe the waveform in Figure 8 for a moment. Verify that the amplitude is at least 2.5 V<sub>p-p</sub> and that the positive and negative amplitude are about equal. Since the waveform is only output for a moment when the PROGRAM key is pressed, press this key over and over until you have checked the waveform.

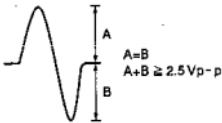


Figure 8

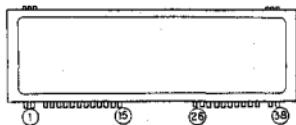
### [Judging the pickup]

Do not judge the pickup until all the adjustments have been made correctly. In the following cases, there may be something wrong with the pickup.

1. The tracking error signal amplitude is extremely small (less than 2 V<sub>p-p</sub>).
2. The focus error signal amplitude is extremely small (less than 2.5 V<sub>p-p</sub>).
3. The positive and negative amplitudes of the focus error signal are extremely asymmetrical (2:1 ratio or more).
4. The RF signal is too small (less than 0.8 V<sub>p-p</sub>) and even if VRI (laser power) is adjusted, the RF signal can not be brought up to the standard level.

## 7. FL INFORMATION

## EXTERNAL VIEWS

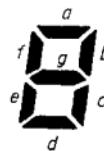


## DISPLAY PATTERN ANODE GRID ASSIGNMENT



## ANODE GRID ASSIGNMENT AND PIN ASSIGNMENT

	G1	G2	G3	G4	G5	G6	G7	G8	G9	G10
a	a	a	a	a	a	a	a		►	a
b	b	b	b	b	b	b	b	SCAN		b
c	c	c	c	c	c	c	c	►OPEN	54	c
d	d	d	d	d	d	d	d	reserve	46	d
e	e	e	e	e	e	e	e	►(single)	60	e
f	f	f	f	f	f	f	f	►(scan)	90	f
g	g	g	g	g	g	g	g	SINGLE	74	g
h		DISPLAY	OFF	FADER	REP	AUTO	SPACE	► OFF	TIME FADE	
i	1	2	4	5	7	8	10	►(ALL)	AUTO	
j	TRACK	STEP	6		9	PGM	ALL	EDIT	:	
k		12	INDEX	15	MIN	18	►(RND)	PEAK SEARCH	SEC	
l	11	13	14	16	17	19	DEL	RND	COMPU	



## PIN ASSIGNMENT

Pin No.	1	2	3	4	5	6	7	8	9	10	11	12	13
Assignment	F	F	NP	e	f	g	h	a	b	c	d	i	j
Pin No.	14	15	16	17	18	19	20	21	22	23	24	25	26
Assignment	k	l	NP	NP	NP	NP	GJ						
Pin No.	27	28	29	30	31	32	33	34	35	36	37	38	
Assignment	G2	G3	G4	G5	G6	G7	G8	G9	G10	NP	F	F	

F: Filament

G1-G10: Grid

a-l: Anode

NP: No pin

## 8. FOR PD-8700/HEM, HB, SD AND PD-8700-S/HEWM TYPES

### NOTES :

- Parts without part number cannot be supplied.
- Parts marked by “” are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.
- The  mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.

### CONTRAST OF MISCELLANEOUS PARTS

The PD-8700/HEM, HB, SD and PD-8700-S/HEWM types are the same as the PD-31/KU type with the exception of the following sections.

Mark	Symbol & Description	Part No.					Remarks
		PD-31/KU	PD-8700 /HEM	PD-8700 /HB	PD-8700 /SD	PD-8700-S /HEWM	
 	Mother board assembly	PWM1448	PWM1449	PWM1449	PWM1449	PWM1449	*1
 	S trans board assembly	Non supply	Non supply	Non supply	Non supply	Non supply	*2
 	A trans board assembly	Non supply	Non supply	Non supply	Non supply	Non supply	*2
 	AC power cord	PDG1015	PDG1003	PDG1036	PDG1013	PDG1003	
 	Power transformer S(AC120V)	PTT1179					
 	Power transformer S(AC220,240V)		PTT1178	PTT1178		PTT1178	
 	Power transformer S(AC110,120-127, 220, 240V)			PTT1181		PTT1178	
 	Power transformer A(AC120V)	PTT1183					
 	Power transformer A(AC220,240V)		PTT1182	PTT1182		PTT1182	
 	Power transformer A(AC110,120-127, 220, 240V)			PTT1185			
 	Voltage selector						
 	Strain relief	CM-22C	CM-22B	CM-22B	CM-22B	CM-22B	
 	Cord with plug (mini plug)	PDF-319					
 	Front panel assembly	PEA1164	PEA1132	PEA1132	PEA1132	PEA1152	
 	Control panel	PNW1948	PNW1948	PNW1948	PNW1948	PNW2009	
 	Power button	PAC1569	PAC1569	PAC1569	PAC1569	PAC1590	
 	Select button	PAC1570	PAC1570	PAC1570	PAC1570	PAC1591	
 	Play button	PAC1571	PAC1571	PAC1571	PAC1571	PAC1592	
 	Search button	PAC1572	PAC1572	PAC1572	PAC1572	PAC1593	
 	Headphone knob S					PAC1597	
 	Knob C	RAC1608	RAC1608	RAC1608	RAC1608		
 	Slide knob	RAC1428	RAC1428	RAC1428	RAC1428	PAC1599	
 	Tray panel	PNW2025	PNW1949	PNW1949	PNW1949	PNW2011	
 	Display window	PAM1503	PAM1488	PAM1488	PAM1503	PAM1488	
 	Bonnet	PYV1148	PYV1148	PYV1148	PYV1148	PYV1154	
 	CD packing case	PHG1679	PHG1678	PHG1678	PHG1678	PHG1680	For packing

\*1 : As to the parts list of the Mother board assembly, refer to page 12.

\*2 : These assemblies are the same as the PD-31/KU type for the service supply parts.

Mark	Symbol & Description	Part No.					Remarks
		PD-31/KU	PD-8700 /HEM	PD-8700 /HB	PD-8700 /SD	PD-8700-S /HEWM	
	Operating instructions(English)	PRB1151					
	Operating instructions (English/French)		PRE1142				
	Operating instructions (German/Italian/Dutch/Swedish/ Spanish/Portuguese)			PRF1042			
	Operating instructions (Spanish)				PRC1035		

## 9. FOR PD-7700/KU, KC, HEM, HB, SD, HPW AND PD-7700-S/HEWM TYPES

## 9.1 CONTRAST OF MISCELLANEOUS PARTS

#### NOTES:

- *Parts without part number cannot be supplied.*
- *Parts marked by "●" are not always kept in stock. Their delivery time may be longer than usual or they may be*

- The **A** mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.

The RD-7200/KU, KC, HEM, HR, SD, HPW and RD-7200-S/HEWM types are the same as the RD-31/KU type with the exception of the following sections:

Part No.										Remarks
Mark	Symbol & Description	PD-31/KU	PD-7700 /KU	PD-7700 /KC	PD-7700 /HEM	PD-7700 /HB	PD-7700 /SD	PD-7700 /HPW	PD-7700-S /HEWM	
▲	Mother board assembly	PWM1448	PWM1444	PWM1444	PWM1445	PWM1445	PWM1447	PWM1444	PWM1445	
▲	Audio board assembly	PWZ2218	-----	-----	-----	-----	-----	-----	-----	
▲	S trans board assembly	Non supply	-----	-----	-----	-----	-----	-----	-----	
▲	Power board assembly	Non supply	-----	-----	-----	-----	-----	-----	-----	
▲	Overstate board assembly	PWZ2212	PWZ2211	PWZ2211	PWZ2211	PWZ2211	PWZ2211	PWZ2211	PWZ2211	
▲	SW board assembly	Non supply	Non supply	Non supply	Non supply	Non supply	Non supply	Non supply	Non supply	
▲	Headphone board assembly	Non supply	Non supply	Non supply	Non supply	Non supply	Non supply	Non supply	Non supply	
▲	Jack board assembly	Non supply	-----	-----	-----	-----	-----	-----	-----	
▲	Voltage selector	-----	-----	-----	-----	-----	PSB1002	-----	-----	
▲	Power transformer S(AC120V)	PTT1179	PTT1179	PTT1179	PTT1178	PTT1178	PTT1178	PTT1178	PTT1178	
▲	Power transformer S(AC220,240V)	-----	-----	-----	-----	-----	-----	-----	-----	
▲	Power transformer S(AC110, 120-127, 220, 240V)	-----	-----	-----	-----	-----	PTT1181	-----	-----	
▲	Power transformer A(AC120V)	PTT1183	PTD1015	PTD1015	PTD1003	PTD1036	PTD1013	PTD1013	PTD1006	PTD1003
▲	AC power cord	CM-22C	CM-22C	CM-22C	CM-22B	CM-22B	CM-22B	CM-22B	CM-22B	CM-22B
▲	Strain relief	PEA1164	PEA1164	PEA1164	PEA1133	PEA1133	PEA1133	PEA1133	PEA1133	PEA1133
▲	Front panel assembly	PNW1948	PNW1948	PNW1948	PNW1948	PNW1948	PNW1948	PNW1948	PNW1948	PNW1948
▲	Control panel	-----	-----	-----	-----	-----	-----	-----	-----	PNW2009
▲	Power button	PAC1569	PAC1569	PAC1569	PAC1569	PAC1569	PAC1569	PAC1569	PAC1569	PAC1569
▲	Select button	PAC1570	PAC1570	PAC1570	PAC1570	PAC1570	PAC1570	PAC1570	PAC1570	PAC1570
▲	Play button	PAC1571	PAC1571	PAC1571	PAC1571	PAC1571	PAC1571	PAC1571	PAC1571	PAC1571
▲	Search button	PAC1572	-----	-----	-----	-----	-----	-----	-----	-----
▲	Headphone knob	-----	-----	PAC1600	PAC1600	PAC1600	PAC1600	PAC1600	PAC1600	PAC1601
▲	Slide knob	PAC1478	-----	-----	-----	-----	-----	-----	-----	
▲	Knob C	PAC1608	-----	-----	-----	-----	-----	-----	-----	
▲	Display window	PAM1503	PAM1503	PAM1503	PAM1488	PAM1488	PAM1503	PAM1503	PAM1488	
▲	Cord with plug (mini plug)	PDE-310	-----	-----	-----	-----	-----	-----	-----	
▲	Tray panel	PNW2025	PNW1949	PNW1949	PNW1949	PNW1949	PNW1949	PNW1949	PNW1949	PNW2011
▲	Bonnet	PYY1148	PYY1148	PYY1148	PYY1148	PYY1148	PYY1148	PYY1148	PYY1148	PYY1154
▲	CD packing case	PHG1679	PHG1683	PHG1683	PHG1681	PHG1681	PHG1681	PHG1681	PHG1681	PHG1682
▲	Stepper	PNM1134	PNM1070	PNM1070	PNM1070	PNM1070	PNM1070	PNM1070	PNM1070	PNM1070
▲	Insulator	PNW2020	VNK1095	VNK1095	VNK1095	VNK1095	VNK1095	VNK1095	VNK1095	VNK1095
▲	Cord clammer	RNH-184	-----	-----	-----	-----	-----	-----	-----	
▲	BIAS lens	RNH1674	-----	-----	-----	-----	-----	-----	-----	
▲	Operating instructions(English)	PRB1151	PRB1139	PRB1142	PRB1142	PRB1139	PRB1139	PRB1139	PRB1139	
▲	Operating instructions(English/French)	-----	-----	-----	-----	-----	-----	-----	-----	
▲	Operating instructions	-----	-----	-----	-----	-----	-----	-----	-----	
▲	(German/Italian/Dutch/Swedish/Spanish/Portuguese)	-----	-----	-----	-----	-----	-----	-----	-----	PRF1042
▲	Operating instructions(Spanish)	-----	-----	-----	-----	-----	-----	PRC1035	-----	

## 9.2 P.C.B.'s PARTS LIST

### NOTES:

- Parts without part number cannot be supplied.
- Parts marked by "●" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.
- The ▲ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- When ordering resistors, first convert resistance values into code form as shown in the following examples.

Ex.1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J = 5%, and K = 10%).

560Ω 56 × 10<sup>1</sup> 561 ..... RD1/4PS[5][6][1]

47kΩ 47 × 10<sup>3</sup> 473 ..... RD1/4PS[4][7][3]

0.5Ω 0R5 ..... RD2H[0][R][5]K

1Ω 010 ..... RD1P[0][1][0]K

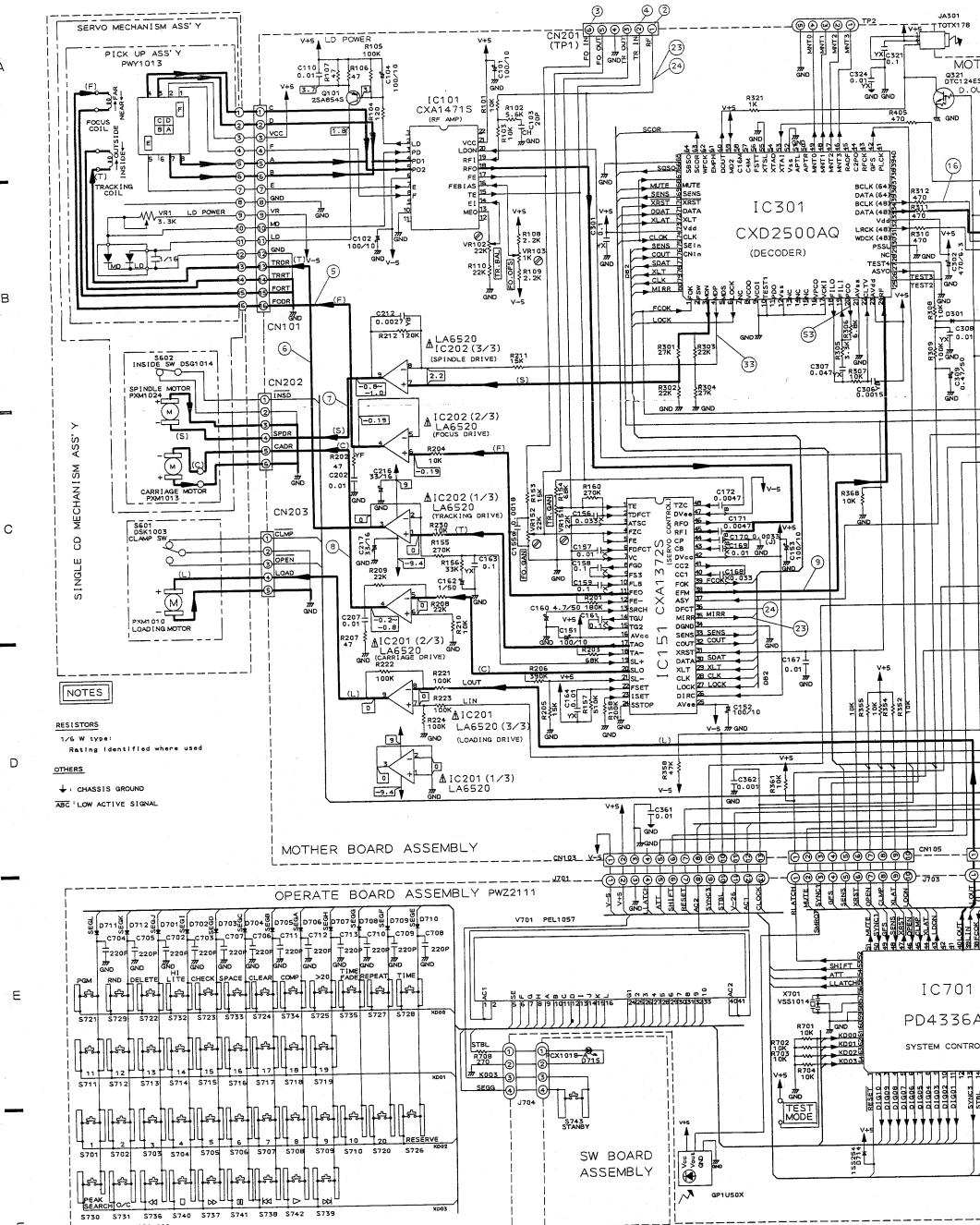
Ex.2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62kΩ 562 × 10<sup>3</sup> 5621 ..... RD1/4SR[5][6][2][1]F

Mark No.	Description	Parts No.	Mark No.	Description	Parts No.	
<b>●MOTHER BOARD ASSEMBLY</b>						
(PWM144: PD-7700/KU, KC and HPW types)			L393	AXIAL INDUCTOR	LAU010K	
(PWM1445: PD-7700/HEM, HB and			L394	AXIAL INDUCTOR	LAU010K	
PD-7700-S/HEWM types)			<b>CAPACITORS</b>			
(PWM1447: PD-7700/SD type)			C11, C13	CERAMIC CAPACITOR	CKCYF103Z50	
<b>SEMICONDUCTORS</b>			C15, C16	CERAMIC CAPACITOR	CKCYF103Z50	
▲ IC20 REGULATOR IC	M5298P		C25	ELECTROLYTIC CAPACIT	CEAS472M16	
IC21 REGULATOR IC	NJM78L06A		C26	ELECTR.CAPACITOR	CEAS222M16	
IC22 REGULATOR IC	NJM79L06A		C27	ELECTROLYTIC CAPACIT	CEAS471M6R3	
IC23 REGULATOR IC	NJM7805FA		C28	ELECTR.CAPACITOR	CEAS101M10	
▲ IC31 IC(PWM1445, PWM1447 only)	ICP-N10		C52	ELECTR.CAPACITOR	CEAS101M35	
IC101 PRE AMP IC	CXA1471S		C60	ELECTR.CAPACITOR	CEAS010M50	
IC151 SERVO IC	CXA1372S		C61, C62	ELECTR.CAPACITOR	CEAS101M16	
▲ IC201,IC202 POWER OP-AMP,IC	LA6520		C63	ELECTR.CAPACITOR	CEAS102M16	
IC301 EPM DEMODULATION IC	GXD2500AQ		C101, C102	ELECTR.CAPACITOR	CEAS101M10	
IC401 D/A CONVERTER,IC	PD2026A		C103	CERAMIC CAPACITOR	CCCH200J50	
IC402 OP-AMP IC	M5238PF		C104	ELECTR.CAPACITOR	CEAS101M10	
(PWM1444, PWM1447 only)			C110	CERAMIC CAPACITOR	CKCYF103Z50	
IC402 OP-AMP IC	NJM5532DD		C151-C153	ELECTR.CAPACITOR	CEAS101M10	
(PWM1445 only)			C155	CERAMIC CAPACITOR	CKCYB182K50	
Q101 TRANSISTOR	2SA854S		C156	CERAMIC CAPACITOR	CGCYX333K25	
Q321,Q351 TRANSISTOR	DTC124ES		C157	CERAMIC CAPACITOR	CGCYX103K25	
Q391 TRANSISTOR	2SC1740S		C158, C189	CERAMIC CAPACITOR	CGCYX104K25	
Q401-Q404 TRANSISTOR	2SD2144S		C160	ELECTR.CAPACITOR	CEAS4R7M50	
Q405 TRANSISTOR	DTC124ES		C161	CERAMIC CAPACITOR	CGCYX104K25	
Q406 TRANSISTOR	DTA124ES		C162	ELECTR.CAPACITOR	CEAS010M50	
Q451,Q452 TRANSISTOR	DTA124ES		C163	CERAMIC CAPACITOR	CGCYX104K25	
Q453,Q454 TRANSISTOR	2SB1296		C164	CERAMIC CAPACITOR	CGCYX103K25	
▲ D11-D14,D52 DIODE	11ES2		C167	CERAMIC CAPACITOR	CKCYF103Z50	
D54 ZENNER DIODE	MTZJ18B		C168	CERAMIC CAPACITOR	CGCYX333K25	
D301 DIODE	1SS254		C169	CERAMIC CAPACITOR	CGCYX103K25	
D391-D394 DIODE(PWM1444 only)	1SS254		C170	CERAMIC CAPACITOR	CKCYB332K50	
D395-D397 DIODE	1SS254		C171, C172	CERAMIC CAPACITOR	CKCYB472K50	
D451,D452 DIODE	1SS254		C202, C207	CERAMIC CAPACITOR	CKCYF103Z50	

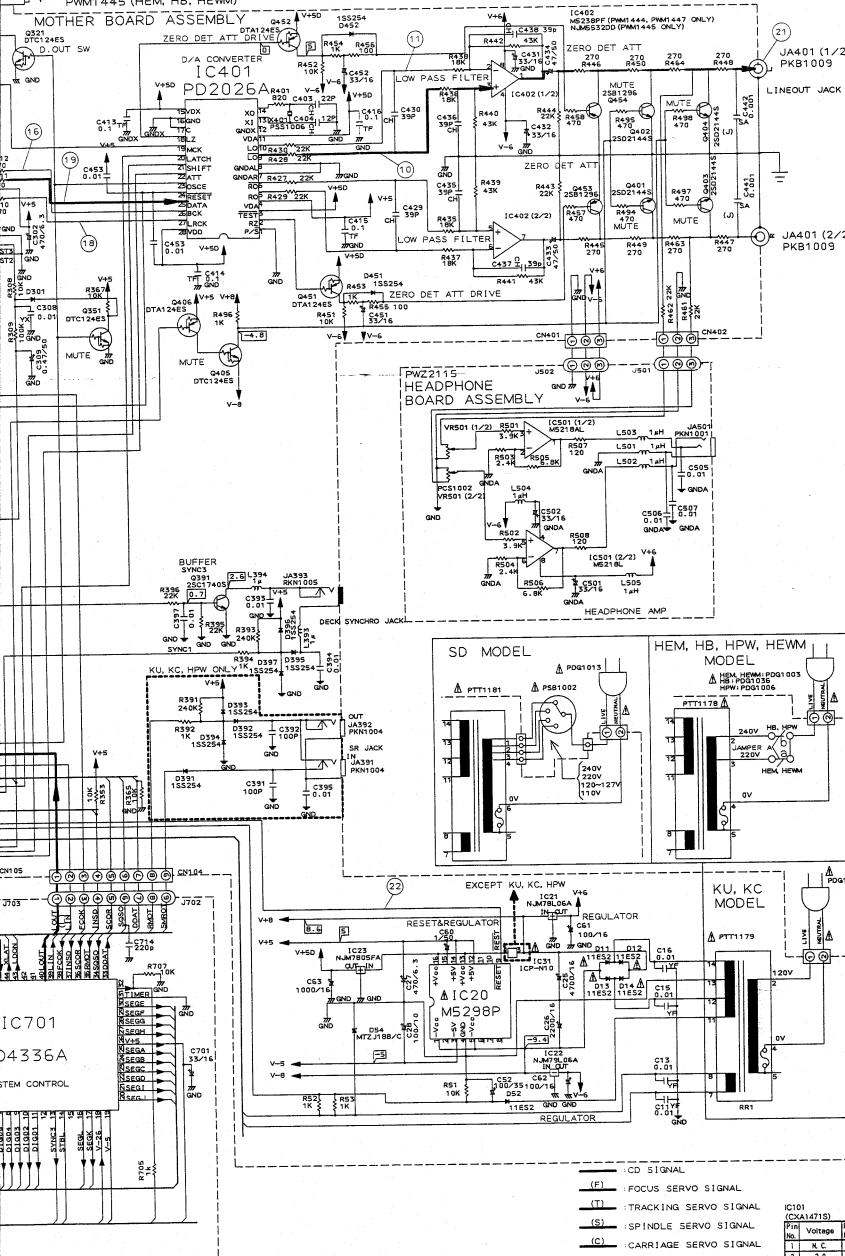
Mark	No.	Description	Parts No.	Mark	No.	Description	Parts No.
C212		CERAMIC CAPACITOR	CKCYB272K50	<b>OPERATE BOARD ASSEMBLY (PWZ2111)</b>			
C216,C217		ELECTR.CAPACITOR	CEAS330M16	<b>SEMICONDUCTORS</b>			
C301		CERAMIC CAPACITOR	CGCYX104K25	IC701		MICROCOMPUTER,IC	PD4336A
C302		ELECTROLYTIC CAPACIT	CEAS471M6R3	D701-D714		DIODE	1SS254
C306		CERAMIC CAPACITOR	CKCYB152K50	<b>SWITCHES</b>			
C307		CERAMIC CAPACITOR	CGCYX473K25	S701-S742		SWITCH	PSG1006
C308		CERAMIC CAPACITOR	CGCYX103K25	1-20, PGM, DELETE, CHECK, CLEAR, >20, RESERVE, REPEAT, TIME, RND, PEAK SEARCH, O/L, HI LITE SCAN, AUTO SPACE, COMPU, TIME FADE, <:, >, <:, >, STOP(□), PLAY(>)			
C309		ELECTR.CAPACITOR	CEASR47M50	<b>CAPACITORS</b>			
C321		CERAMIC CAPACITOR	CGCYX104K25	C701		ELECTR.CAPACITOR	CEAS330M16
C324		CERAMIC CAPACITOR	CKCYF103Z50	C702-C714		AXIAL CAPACITOR	CKPUYB221K50
C361		CERAMIC CAPACITOR	CKCYF103Z50	<b>RESISTORS</b>			
C362		CERAMIC CAPACITOR	CKCYB102K50	All resistors			RD1/6PM□□□
C391,C392		CERAMIC CAPACITOR (PWM1444 only)	CCCSL101J50	<b>OTHERS</b>			
C393,C394		CERAMIC CAPACITOR	CKCYF103Z50	V701	FL INDICATOR TUBE	PEL1657	
C395		CERAMIC CAPACITOR (PWM1444 only)	CKCYF103Z50	X701	CERAMIC RESONATOR	VSS1014	
C397		CERAMIC CAPACITOR	CKCYF103Z50		PHOTO SENSOR UNIT	GP1U50X	
C403		CERAMIC CAPACITOR	CCCCH220J50	<b>SW BOARD ASSEMBLY</b>			
C404		CERAMIC CAPACITOR	CCCCH120J50	<b>SEMICONDUCTORS</b>			
C413-C416		AUDIO FILM CAPACITOR	CFTXA104J50	D715	LED	PCX1018	
C429,C430		CERAMIC CAPACITOR	CCCCH390J50	<b>SWITCHES</b>			
C431,C432		ELECTR.CAPACITOR	CEAS330M16	S743	SWITCH (ON/STN BY)	PSG1006	
C433,C434		ELECTR.CAPACITOR	CEAS47M50	<b>HEADPHONE BOARD ASSEMBLY</b>			
C435-C438		CERAMIC CAPACITOR	CCCCH390J50	<b>SEMICONDUCTORS</b>			
C441,C442		PL.STYRENE CAPACITOR	CQSA102J50	IC501	OP-AMP,IC	M5218AL	
C451,C452		ELECTR.CAPACITOR	CEAS330M16	<b>COILS</b>			
C453		CERAMIC CAPACITOR	CKCYF103Z50	L501-L505	AXIAL INDUCTOR	LAU010K	
<b>RESISTORS</b>				<b>CAPACITORS</b>			
VR102	VR		VRTB6VS223	C501,C502	ELECTR.CAPACITOR	CEAS330M16	
VR103	VR		VRTB6VS102	C505-C507	CERAMIC CAPACITOR	CKCYF103Z50	
VR151	VR		VRTB6VS223	<b>RESISTORS</b>			
VR152	VR		VRTB6VS223	VR501	VARIABLE RESISTOR	PCS1002	
R301		CARBON FILM RESISTOR (PWM1444 only)	RD1/6PM244J	Other resistors		RD1/6PM□□□	
R302		CARBON FILM RESISTOR (PWM1444 only)	RD1/6PM102J	<b>OTHERS</b>			
Other resistors			RD1/6PM□□□	JA501	JACK	RKN1001	
<b>OTHERS</b>							
CN101		CONNECTOR	52045-1610				
JA301		OPTICAL OUTPUT JACK	TOTX178				
JA391		JACK/12V(PWM1444 only)	PKN1004				
JA392		JACK/12V(PWM1444 only)	PKN1004				
JA393		JACK (mini)	PKN1005				
JA401		JACK (2P)	PKB1009				
X401		XTAL RES (OSC)	PSS1006				

#### 9.4 SCHEMATIC DIAGRAM



JA301  
TOTX178  
1  
PWM1444 (KU, KC, HPW)  
PWM1447 (SD)  
PWM1445 (HEM, HR, HFWM)

**MOTHER BOARD ASSEMBLY**

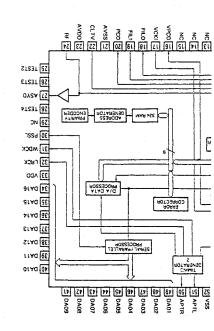
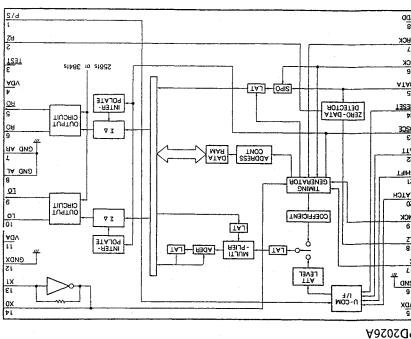
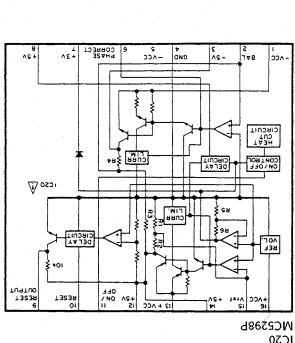


Pin No	Pin Voltage	Pin No	Pin Voltage
1	0	25	-5
2	0	26	5
3	0	27	-5
4	0	28	5
5	0	29	-5
6	0	30	5
7	0	31	5
8	0	32	0
9	0	33	5
10	0	34	0
11	1	35	0
12	0	36	N.C.
13	0.2	37	1
14	0	38	2.5
15	0	39	5
16	5	40	0
17	0	41	-1.7
18	0	42	5
19	0	43	-0.75
20	0.2, 0.8	44	1
21	0	45	0
22	-4	46	5
23	1.3	47	-5
24	0	48	5

IC#	Component	Pin#	Voltage
1	5	4	K.C.
2	5	42	S
3	5	43	K.C.
4	2.6	44	K.C.
5	1.8	45	K.C.
7	5	47	2
8	5	48	0
9	0	49	C - 0.5
10	5	50	0
11	5	51	K.C.
12	0	52	0
13	5	53	2.5
14	5	54	K.C.
15	5	55	K.C.
16	5	56	K.C.
17	0	57	K.C.
18	2.5	58	K.C.
19	2.4	59	S
20	0	60	K.C.
21	0	61	K.C.
22	2.5	62	K.C.
23	5	63	K.C.
24	0	64	K.C.
25	0	65	K.C.
26	0	66	3.3 - 0.5
27	0.5	67	S
28	5	68	K.C.
29	5	69	2.1 - 0.5
30	5	70	K.C.
31	1.3	72	71
32	1.3	73	72
33	2.5	74	73
34	5	75	74
35	5	76	75
36	5	77	76
37	5	78	77
38	5	79	5
39	5	80	5
40	5	81	5
41	5	82	5
42	5	83	5

ICRU (PCG25)	ICRU (PCG25)
0	No data
1	5.5
2	20
3	34
4	34
5	34-34.7
6	24-34.7-38.5
7	24-34.7-38.5
8	24-34.7-42.5
9	24-34.7-42.5
10	24-34.7-42
11	24-34.7-43.5
12	44
13	5.0
14	5.0
15	4.0
16	25.5-37.5-38.5
17	-1.0
18	-16.0
19	-5.0
20	-11.0-15.5
21	-12.5-15.5
22	-12.5-15.5-16.5
23	-3.0-4.0-16.5
24	-4.0-16.5
25	-6.5-8.5-16.5
26	5.0
27	5.0
28	-12.5-15.5-16.5
29	-12.5-15.5-16.5
30	-12.5-15.5-16.5
31	0
	63

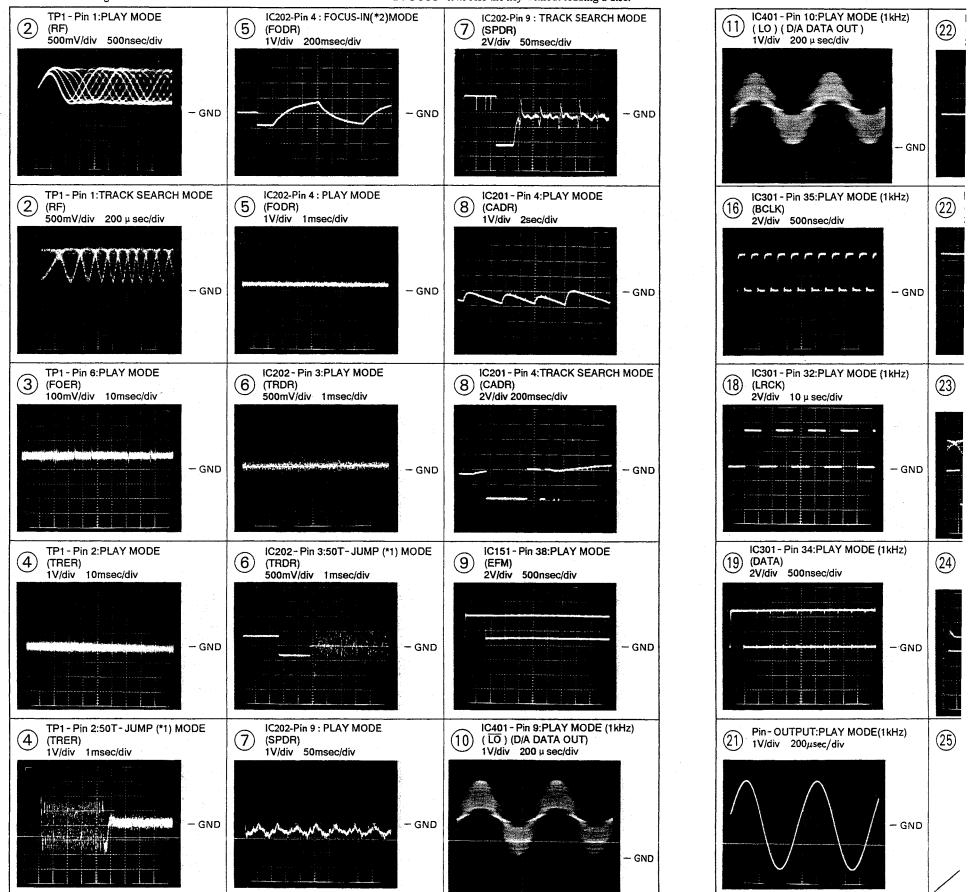
IC401 (PD2026A)			
Pin No.	Voltage	Pin No.	Volt
1	0	15	
2	0	16	
3	5	17	N.
4	5	18	
5	2.4	19	
6	2.6	20	
7	0	21	
8	0	22	
9	2.6	23	
10	2.4	24	
11	5	25	
12	0	26	
13	2.4	27	

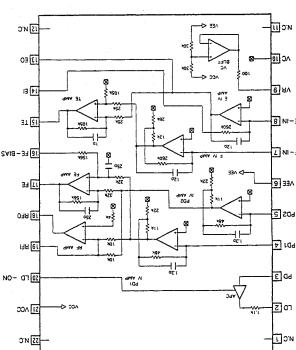


### 9.3 WAVEFORMS

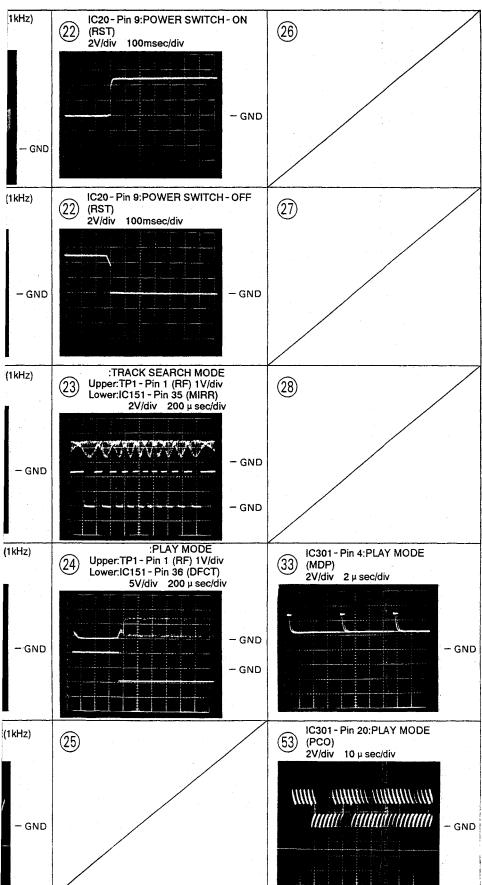
Note: The encircled numbers denote measuring in the schematic diagram.

\*1 50T-JUMP: After switching to the pause mode, press the manual search key.  
 \*2 FOCUS-IN: Press the key without loading a disc.





• IC BLOCK DIAGRAM



1. RESISTORS :

Indicated in  $\Omega$ , 1/4W, 1/W and 1/W,  $\pm 5\%$  tolerance unless otherwise noted  
k :  $k\Omega$  M :  $M\Omega$ , (F) :  $\pm 1\%$ , (G) :  $\pm 2\%$ , (K) :  $\pm 10\%$ , (M) :  $\pm 20\%$  tolerance.

2. CAPACITORS :

Indicated in capacity ( $\mu\text{F}$ )/voltage(V) unless otherwise noted p :  $\text{pF}$ . Indication without voltage is 50V except electrolytic capacitor.

3. VOLTAGE, CURRENT :

$\overline{\text{---}}$  : DC voltage (V) at play state.  
 $\text{---}$  : DC current at play state.  
Value in ( ) is DC current at stop state.

4. OTHERS :

• : Signal route.  
◎ : Adjusting point.  
The  $\Delta$  found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.  
※ marked capacitors and resistors have parts numbers.

This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.

5. SWITCHES : (The underlined indicates the switch position)

SWITCH BOARD ASSEMBLY

S743 : POWER ON-OFF

OPERATE BOARD ASSEMBLY

S701 : 1	S723 : CHECK
S702 : 2	S724 : CLEAR
S703 : 3	S725 : > 20
S704 : 4	S726 : RESERVE
S705 : 5	S727 : REPEAT
S706 : 6	S728 : TIME
S707 : 7	S729 : RND
S708 : 8	S730 : PEAK SEARCH
S709 : 9	S731 : O/L
S710 : 10	S732 : HI LITE SCAN
S711 : 11	S733 : AUTO SPACE
S712 : 12	S734 : COMP
S713 : 13	S735 : TIME FADE EDIT
S714 : 14	S736 : $\Delta$ MANUAL SEARCH
S715 : 15	S737 : $\Delta$ TRACK SEARCH
S716 : 16	S738 : $\Delta$ TRACK SEARCH
S717 : 17	S739 : $\Delta$ TRACK SEARCH
S718 : 18	S740 : STOP( $\square$ )
S719 : 19	S741 : PAUSE( $\square$ )
S720 : 20	S742 : PLAY( $\triangleright$ )
S721 : PGM	(S743 : ON/STN BY)
S722 : DELETE	

Line Voltage Selection (For HB, HEM, HPW and HEWM types)

Line voltage can be changed with the following steps.

1. Disconnect the AC power cord.
2. Remove the top cover.
3. Change the position of the jumper wire A as follows

Voltage	Jumper wire A position
220V	a
240V	b

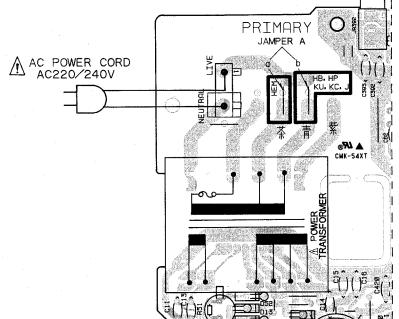
4. Stick the line voltage label on the rear panel.

Parts No.	Description
AXX-193	220V label
AXX-192	240V label

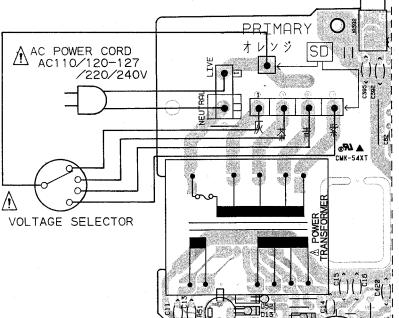
## 9.5 P.C.BORDS CONNECTION DIAGRAM

A

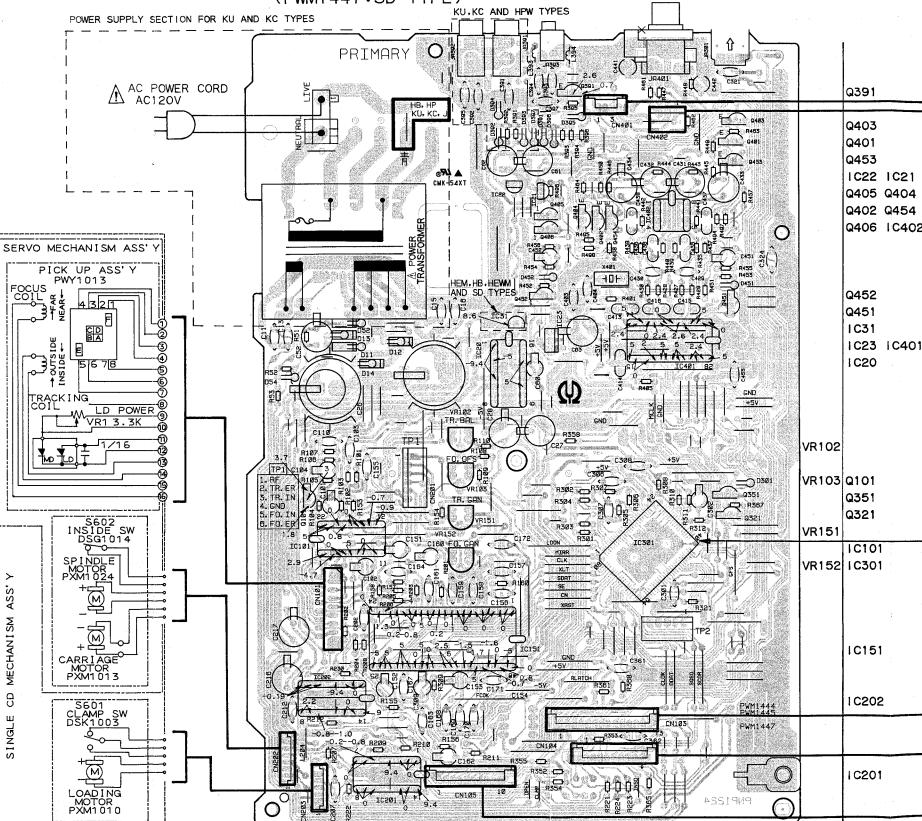
#### POWER SUPPLY SECTION FOR HEM, HB, HPW AND HEMM TYPES

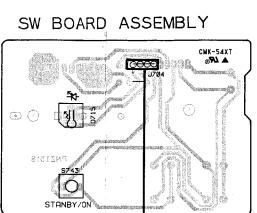
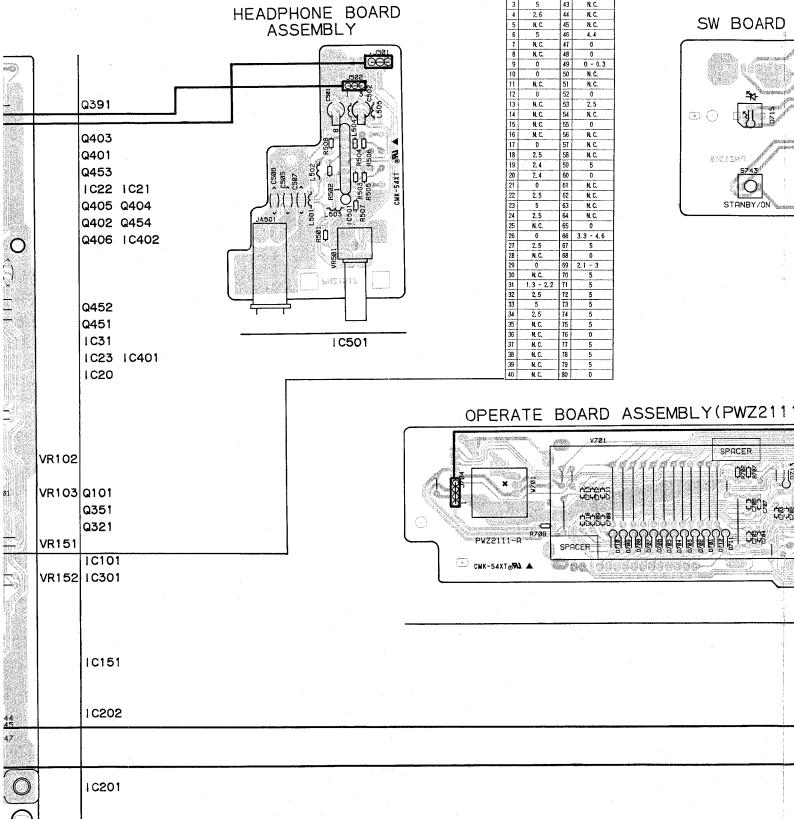


## C POWER SUPPLY SECTION FOR SP TYPE



MOTHER BOARD ASSEMBLY  
(PMM1444:KU,KC AND HPW TYPES)  
(PMM1445:HEM,HB AND HEWM TYPES)  
(PMM1447:SD TYPE)

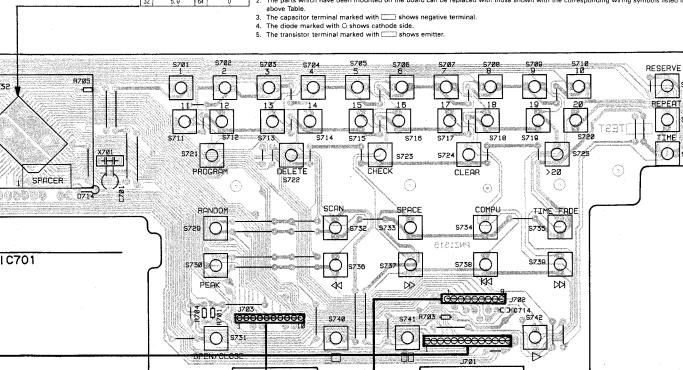


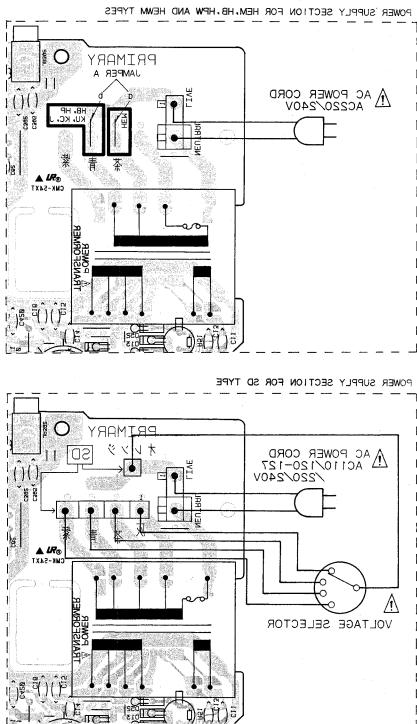
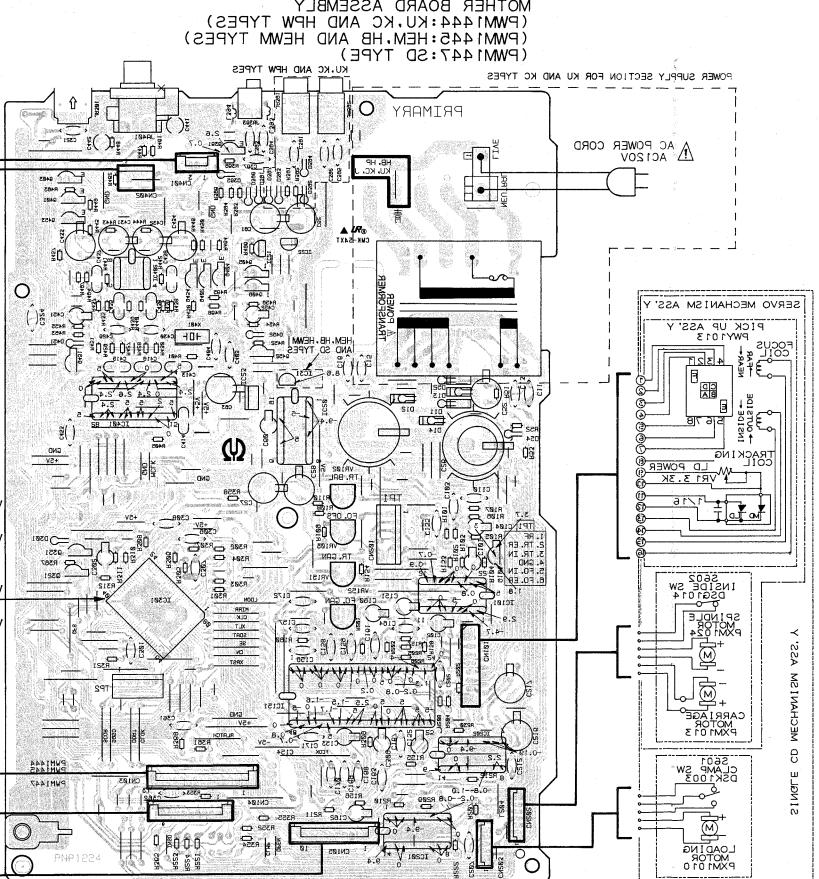


Part No.	Value
1	
2	-24
3	-24
4	-24
5	-24
6	-24
7	-24
8	-24
9	-24
10	-24
11	-24
12	
13	
14	
15	
16	-21
17	
18	-
19	
20	-1T
21	
22	-12
23	-3
24	-4
25	-6
26	
27	

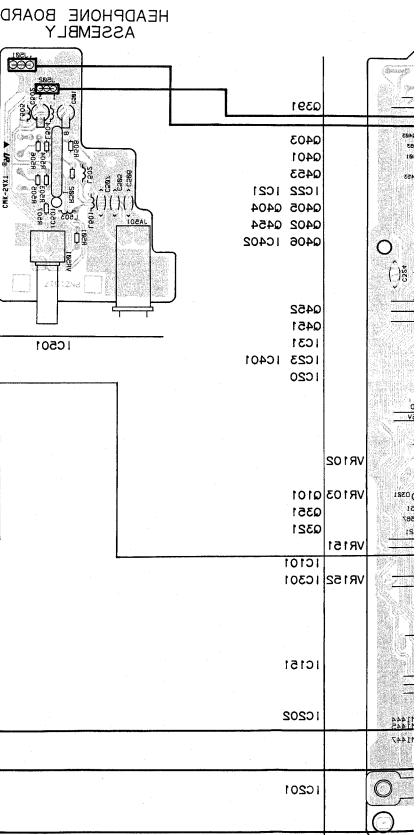
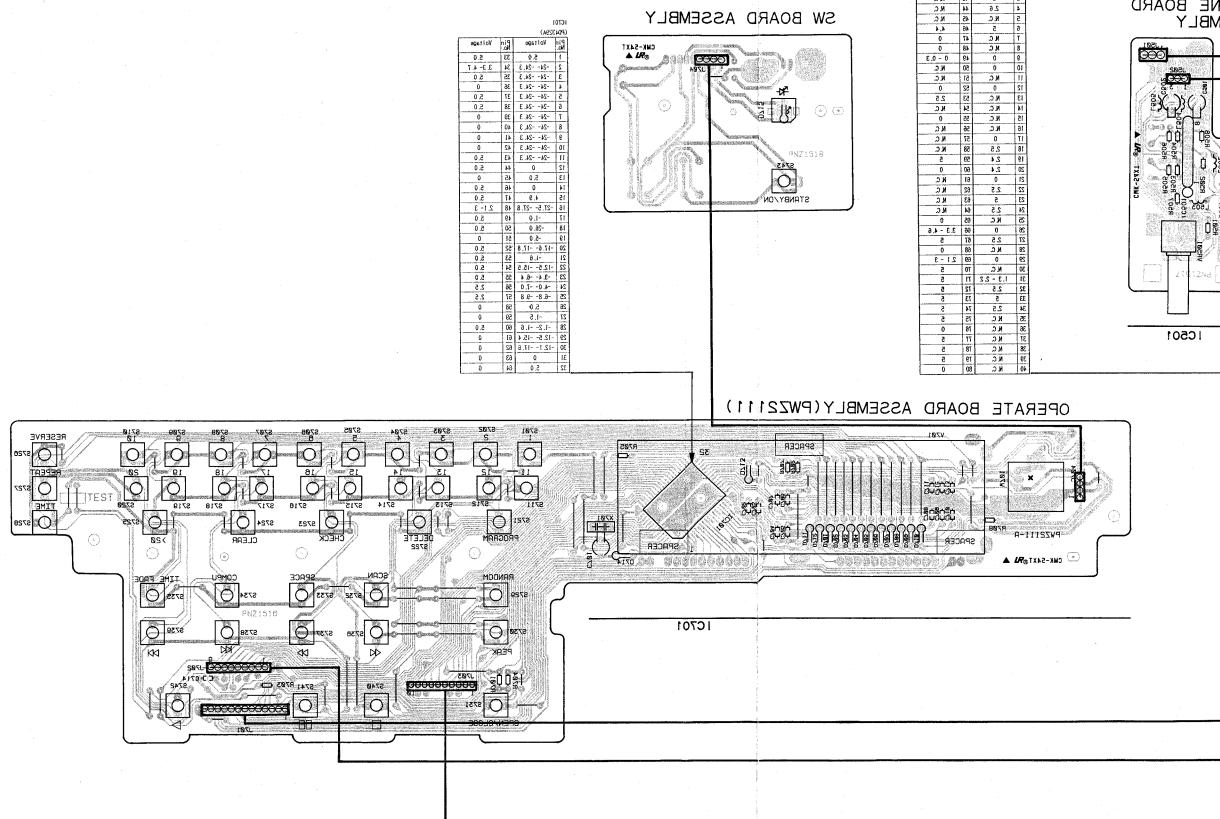
CB. pattern diagram indication	Corresponding part symbol	Part name	PC.B. pattern diagram indication	Corresponding part symbol	Part name
		Transistor			Ceramic capacitor
					Mylar capacitor
		FET			Styrene capacitor
					Electrolytic capacitor (Non polarized)
					Electrolytic capacitor (Nostrous)
					Electrolytic capacitor (Polarized)
					Electrolytic capacitor (Polarized)
					Power capacitor
					Semi-fixed resistor
					Resistor array
					Resistor

1. This P.C.B. connection diagram is viewed from the parts mounted side.  
2. The parts which have been mounted on the board can be replaced with those shown with the corresponding wiring symbols listed in Table 3.  
3. The capacitor terminal marked with  shows negative terminal.  
4. The diode marked with  shows cathode side.  
5. The transistor terminal marked with  shows emitter.

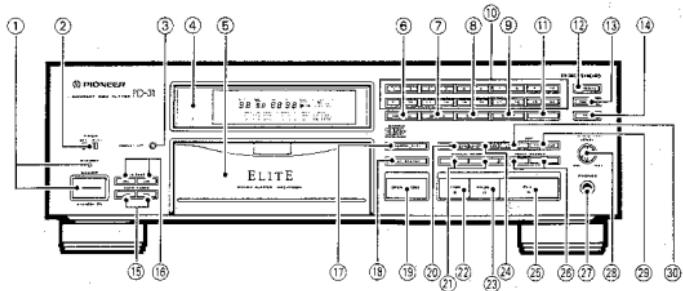




This P.C.B. connection diagram is viewed from the foil side.



## 10. PANEL FACILITIES



### FRONT PANEL

#### ① POWER STANDBY/ON switch and indicator

Press this switch to turn the power on. The unit will set to the standby mode and the STANDBY indicator will light.

#### ② TIMER OFF/PLAY switch

#### ③ DISPLAY OFF button

#### ④ Remote sensor

#### ⑤ Disc tray

#### ⑥ PROGRAM button

#### ⑦ DELETE button

#### ⑧ CHECK button

#### ⑨ CLEAR button

#### ⑩ Track number buttons (1-20)

#### ⑪ >20 button

#### ⑫ REVERSE button

#### ⑬ REPEAT button

#### ⑭ TIME button

#### ⑮ AUTO FADER buttons (↔, ↔)

#### ⑯ INDEX SEARCH buttons (↔, ↔)

#### ⑰ RANDOM PLAY button

#### ⑱ PEAK SEARCH button

#### ⑲ OPEN/CLOSE button

#### ⑳ HI-LITE SCAN button

#### ㉑ MANUAL SEARCH buttons (◀◀, ▶▶)

#### ㉒ STOP button (■)

#### ㉓ PAUSE button (■■)

#### ㉔ AUTO SPACE button

#### ㉕ PLAY button (▶)

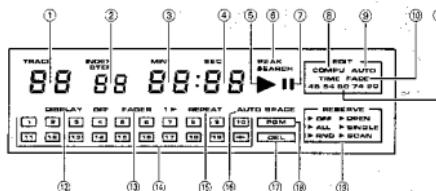
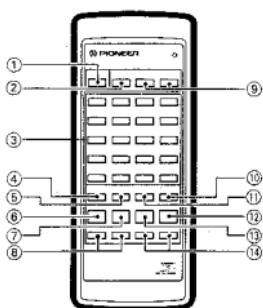
#### ㉖ TRACK SEARCH buttons (◀◀◀, ▶▶▶)

#### ㉗ Headphones jack (PHONES)

#### ㉘ Headphones/line volume control (PHONES/LINE LEVEL)

#### ㉙ TIME FADE EDIT button

#### ㉚ Program edit button (EDIT) (■ COMPU/■■ AUTO)



### REMOTE CONTROL UNIT

Buttons listed here but not accompanied with explanations have the same functions as the corresponding front panel buttons.

- ① POWER button
- ② OPEN/CLOSE button
- ③ Track number buttons (1–20)
- ④ HI-LITE SCAN button
- ⑤ RESERVE button
- ⑥ RANDOM PLAY button
- ⑦ STOP button (■)
- ⑧ Manual search buttons (MANUAL ▲, ▼)
- ⑨ OUTPUT LEVEL buttons (–, +)
- ⑩ > 20 button
- ⑪ PROGRAM button
- ⑫ PLAY button (▶)
- ⑬ PAUSE button (■)
- ⑭ Track search buttons (TRACK ▲, ▼)

### DISPLAY

- ① Displays track numbers (01–99) during playback or track search.
- ② Displays index numbers (sub-divisions of tracks); during program input, indicates program steps.
- ③ Displays track playing time and remaining time (minutes).
- ④ Displays track playing time and remaining time (seconds).
- ⑤ Lights during playback.
- ⑥ Lights when peak volume levels on the disc are detected.
- ⑦ Lights during playback pause.
- ⑧ Lights during use of computer allocated program editing or auto program editing.
- ⑨ Lights during auto program editing.
- ⑩ Lights during time fade editing.
- ⑪ Indicates the editing time.
- ⑫ Lights when display is in OFF mode.
- ⑬ Lights during operation of fade function.
- ⑭ Calendar display. Lighted numbers indicate total number of tracks on the disc (during program input and program playback, indicates programmed tracks). When a track completes playback, the corresponding lighted number goes out. Arrow mark [→] lights for tracks higher than "19".
- ⑮ Lights during repeat playback. (During single-track repeat, the [1▶] indicator also lights).
- ⑯ Lights during auto space.
- ⑰ Lights during delete mode.
- ⑱ Lights during program mode.
- ⑲ When "reserve" function is activated, these indicators light in correspondence to the reserved functions (OFF, OPEN, ALL, SINGLE, RND, SCAN).

## 11. SPECIFICATIONS

### 1. General

Type	Compact disc digital audio system
Usable discs	Compact Disc
Power requirements	AC 120V, 60Hz
Power consumption	18W
Operating temperature	+5°C - +35°C (+41°F - +95°F)
Weight	5.0kg (11lb)
External dimensions	420(W) x 274(D) x 135(H)mm 16-9/16(W) x 10-13/16(D) x 5-5/16(H) in.

### 2. Audio section

Frequency response	2Hz - 20kHz ±0.5dB
S/N	108dB or more (EIAJ)
Dynamic range	97dB or more (EIAJ)
Channel separation	102dB or more (EIAJ)
Total harmonic distortion	0.0022% or less (EIAJ)
Wow and flutter	Limit of measurement (±0.001% W.PEAK) or less (EIAJ)
Number of channels	2 channels (stereo)

### 3. Output terminal

- Audio line output terminals (FIXED)
- Audio line output terminals (VARIABLE)
- CD-DECK SYNCHRO terminal
- Headphone jack (with motor drive volume control)
- Optical digital output terminal
- Control input/output terminals

### 4. Functions

- Play
- Pause
- Stop
- Auto space
- Manual search
- Track search
- Index search
- Peak search
- Hi-lite scan
- Direct selection

- Single track repeat
- All track repeat
- Programmed repeat
- Delete repeat
- Random play repeat
- Programmed random play repeat
- Delete play repeat random
- Programmed playback (up to 24 tracks)
- Delete playback
- Pause program
- Program check
- Program correction
- Program clear
- Auto program edit
- Compu program edit
- Time fade edit
- Digital level control
- Random play
- Programmed random play
- Delete random play
- Fade In/fade out
- Time location
- Reserve
- Display off
- Program hold
- Level hold
- Timer start
- CD-deck synchro

### 5. Accessories

● Remote control unit	1
● Size AAA/R03 dry cell batteries	2
● Output cable	1
● Control cord	1
● Operating instructions	1

#### NOTE:

The specifications and design of this product are subject to change without notice, due to improvements.

